This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

The Refractionist.

VOL. II.

A Monthly Journal of Practical Ophthalmology and Exponent of the Refraction World. Advocates the dissemination of scientific knowledge among the people, in reference to the care of their eyes. Urges the examination of the eyes of all children when entering school and at stated periods thereafter. Condemns the attempts of non-medical men, such as opticians, jewelers, etc., as dangerous in the extreme.

Editors,

FRANCIS F. WHITTIER, A. M., M. D., 74 Boylston St., Boston.
MAURICE F. PILGRIM, A. B., M. D., 472 Congress St., Portland, Me.

Associate Editors,

WM. E. BAXTER, M. D., Bangor.
E. M. MARBOURG, M. D., Pueblo.
J. WALTER PARK, M. D., Harrisburg.
M. F. COOMES, A. M., M. D., Louisville.
W. F. SOUTHARD, A M., M. D., San Francisco.

BOSTON, MASS.
1896.

BOSTON MEDICAL
FEB 12 1903
LIBRARY.

3073

CATALOGUED
FEB 12 1903
E. H. B.

BOSTON MEDICAL
FEB 12 1903
LIBRARY

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. APRIL, 1895. NO. 1

A FEW ABSURD PRACTICES.

BY CLARK W. HAWLEY, M. D., CHICAGO, ILL.
Clinical Assistant Royal London Ophthalmic Hospital, London, England; Oculist and Aurist Cook County Hospital; Consulting Oculist and Aurist St. Mary's Mission and Dispensary.

WE have laws governing the practice of medicine and surgery; the druggist must answer to the State as to his ability to compound; the midwife is held responsible by the same power; our teeth must have the protection of the law thrown around them; even our domestic animals have the same fostering care; an engineer must show his proficiency before he may follow that occupation; nor can the pilot guide the vessel into the harbor or up and down our rivers without being fully qualified; but not so he who is to fit glasses to people's eyes. Any ignoramus may go to some so-called optical school for a month, buy a set of test lenses, a few test charts and possibly an optometer, about which he very likely knows nothing, pack a few spectacles and simple lenses into his grip and start out as Prof. Smith, the World's Greatest "Oculo-optician," (I saw this sign once. Can any one interpret it?) of London, Paris and Chicago. His display of instruments is imposing, and they are mysterious to most people, hence he goes through certain movements with them in such a manner as to inspire confidence and awe, and humbugs them into buying glasses. But even so expensive an outfit is not always necessary, as I will show later on by a very interesting history.

How so many who are quite sensitive as to whom they employ for even the minor ills of the less important portions of their body, can be persuaded to trust the most delicate and sensitive organ of the whole body to the travelling quack and unscrupulous optician, is more than I can understand. Have they a felon, do they go to the shoemaker or the carpenter to have it opened? A broken bone, do they call in the black-

smith to have it welded? But if the eye cannot perform its work properly, too many think that they can just step into the jeweler's or optician's, or purchase of some peddler at the door, and find relief. They purchase glasses on the plan that the cheaper they are the more they save, instead of considering that they are getting something for permanent use, and not like some article of wearing apparel to go out of style in a year. Very few intelligent people buy hats, boots and shoes or wraps of the cheapest and most irresponsible merchant they can find; they trade with Mr. Smith because they feel certain they get reliable goods, but he charges for them. But not so their glasses; they will purchase of some fakir who happens to pass their door. They know they are good 14-karat because they are stamped so. Doubtless they enjoy being humbugged, as they will put confidence in the next smooth-tongued individual who happens along.

When the public learns that the same degree of skill is necessary in fitting glasses as is demanded in other lines of medical work, the fakir will find his occupation gone, and people will go only to the oculist for their prescriptions, and the optician will fill the same,—which is his legitimate calling, and not that of fitting.

Why should such conscienceless rascals as the following be allowed to go about the country preying on the people's ignorance and stupidity?

The following incident occurred not far from Chicago: Mr. Quack was making one of his periodic visits to a western city and gave the following glasses to a child to wear: A pair for distant use on a bright day, and another for the same purpose on a cloudy day; then a pair for reading on a bright day, and a corresponding pair for a cloudy day. He then sized up the parent as to how much he would stand, and the prospect being favorable, he prescribed two more pairs for "general utility." Six pairs of glasses to a small boy! I cannot conceive of such a condition of the eyes as to require a whole optician's case to assist them in performing their function properly. I presume the pocketbook gave out or he would have done something for this suffering child on a very rainy day, and also a pair to wear nights to ward off bad dreams, knowing from experience that children have nightmare fearfully at times. It is no uncommon thing for this man to prescribe three pairs of glasses, for morning, midday and evening reading, all measuring exactly alike! Just imagine a boy going to school with six pairs of glasses in his pocket. If he follows closely instructions, let us see what must happen. Up comes a cloud and out comes his "cloudy day" glasses—(I believe that is the way the instructions to the optician read for them to be labeled); one pair to keep an eye on the teacher at the other side of

the room, the other to be used in getting his lessons and placing pins properly in a neighboring seat. The cloud passes away and the sun floods the room with light, and now the boy dives into another pocket and there appear two pairs labeled " bright day " glasses. He must keep up this see-saw or ruin his eyes and have numerous reflex troubles. When he was to use his " general utility " glasses, I cannot surmise.

What a parody on the intelligence of the boy's parents and the art of fitting spectacles ! It seems to me that a parent with ever so poor judgment could have recognized that the fakir was working him for all he could. The price must have been high, as Mr. Quack is never satisfied with less than twenty-five-dollar fees. Now comes the climax of the affair. So far as refraction was concerned, each pair was a duplicate of the others, the only difference in the six being that some contained a slightly different shade of blue from the others.

The same man prescribed two pairs of spectacles for a lady friend of mine, one for distant use and one for near; on measuring them I discovered them to be exactly alike,—concave cylinders of three-fourths of a dioptry. He gave her a special discount because of his fraternal masonic feeling for her husband, charging only fifty dollars, his usual fee being one hundred dollars for such useful and ornamental spectacles, ground " especially " for her eyes, right on the spot, in the back parlor of the most prominent hotel in the city, and they only lacked her name ground in one corner of the lenses to complete the perfection. She could use neither pair, both being exactly alike, as her error was of the opposite kind, needing convex cylinders of one-half dioptry.

One travelling vender brought his son to me for examination of his eyes, and when I gave him, verbally, his prescription, he requested me to write it, as he did not know what that meant, and he, the son, was just starting out as " Prof. S., of N. Y., the noted optician." The son came to me asking advice about his advertisement. Why he should do so, I am at a loss to know. I wish I could reproduce it word for word, as it contained some of the most absurd statements about optics and the eyes one could imagine. He knew absolutely nothing about eyes, or spectacles either, and I understand he is still on the road (the above occuring some two years ago), so he must find some to humbug that others have neglected.

To illustrate how the more respectable opticians often fit their patients, I will give the following prescription:

R. E.— 1.75 D. cylinder. L. E.— 1.75 D. cylinder.

when it should have been a compound convex combination, thus:

R. E. + 1.00 D. + 2.75 D. cylinder. L. E. + 1.00 D. + 3.50 D. cylinder.

Such an error can be accounted for only by the plea of absolute ignorance. Here concave cylinders were given when the glasses should have been of the opposite kind, convex spherical and cylinders. It is no uncommon thing for patients to be fitted with concave glasses because they brighten distant print, and the optician takes advantage of that fact to sell a pair of glasses, and as they do not suit, he tires the patient out by changes, real or pretended. Here is another example of the same kind: A minister's wife spent a good share of two days in a pseudo-oculist's office trying to be fitted, and finally appeared in my office wearing a pair of concave sphericals, to replace which I found she needed convex cylinders, and rather high at that.

I could multiply such instances by the score, but I do not know as they would be the more convincing because of that fact. Such mistakes are inexcusable, and some restriction sufficiently binding should be put on him who attempts to do the work, so that the public may at least have reasonable confidence that he has made good preparation in that special line, and not have spent only two weeks in some fake optical college. I know of only one way to accomplish it, and that is by demanding that he shall be a graduate of medicine.

Though we may confine it to the medical profession, incompetent men will be numerous enough which cannot be very well avoided; but we can weed out the ignoramus now in the business and protect the public that much. Then the local physician in the country,—and city, for that matter,—should be encouraged to prepare himself to fit the easy cases, such as require only convex glasses for reading. Educate him to be honest and careful, and send difficult cases to those whose training and experience justifies them in confining their practice to that line of work. Too many have an idea that the fitting of glasses is a very simple matter, but like many other seemingly simple procedures, we find when we put them into actual practice, the difficulties are many and hard. I had that feeling myself when in general practice, but this simplicity has deserted me now.

Many times the prescribing of glasses and the differentiating between the need of them and disease requires all the judgment and skill the oculist possesses. It is not a mere mechanical procedure into which no brains should be mixed. Were it so, then it might be possible to go into a store and purchase a pair of spectacles, and that at much less expense than consulting an oculist. But the dangers in such a course are many and the results too serious. While you may be selecting stronger and stronger lenses, some disease may be doing its silent work, and by the time your suspicions are sufficiently aroused to cause you to

consult an oculist, it may be too late. This is no uncommon picture. Within the past month it has been vividly brought to me by a patient who had been buying glasses, thinking that presbyopia was the trouble, when glaucoma was steadily progressing, and suddenly a severe acute attack set in, the result being total blindness in one eye and nearly the same in the other. An operation on that eye stopped the progress of the glaucoma and considerable vision returned. Had she consulted an oculist instead of buying glasses of this and that peddler who happened along, she would probably have had good vision in both eyes, where she only has a little in one.

Before the legislatures will take hold of the evil, public opinion must be so changed and educated as to appreciate the fact that the art of fitting glasses has moved away from the jeweler and the optician, and must learn that many other facts besides one's ability to see well through glasses should and must be taken into consideration.

When the oculist knew but little of the real value of corrected errors of refraction, even of very small degrees, to those suffering from reflex neuroses, and prescribed only simple sphericals, the jeweler could do as well, and the patient oftentimes received just as much benefit.

Since discovering that the muscles of the eye must be taken into consideration, that an uncorrected astigmatic error was more prolific in causing trouble than a high degree of hyperopia, that a cylindrical lens was of more value than a spherical in relieving eye-strain and reflex manifestations, the art of prescribing spectacles has been placed on a higher plane. When a sufficiently strong public opinion shall have been developed the demand will be made that the optician shall follow his proper calling,— the filling of the oculist's prescription, and the retiring of the travelling quack.

The object of this article is not so much to discuss the subject and its remedy, but to illustrate some of the methods employed and the results obtained by the unscrupulous spectacle vender; so let me close by giving you the newest and most unique method yet used in making a diagnosis of the treatment given, and also the method employed to fit glasses.

A four-year-old lad had sand thrown into his eye, causing a severe conjunctivitis only. The father, a physician, brought him to my office for an examination, fearing a more serious injury. The mother sat in the outer office and saw me put cocaine into the little fellow's eyes. A travelling spectacle vender, and he claims to be an oculist, exhibiting his picture lecturing before some students somewhere in Europe as evidence, told her that it was very dangerous to put anything into the eyes; so she immediately came to the conclusion that I had done wrong,

and took the boy directly from my office to Mr. Quack's home. He carries his office about in his little case containing his stock in trade, and goes from house to house and office to office. She waited several hours, but was compelled to leave an order for him to call the next day, which he answered promptly. He proceeded to make the diagnosis in the following manner: Drawing a pleximeter and hammer from his pocket, he percussed both sides of the child's head and discovered a different sound on the side of the sore eye, and called on the ladies present, the father being away, to verify his hearing, which they of course did, to his entire satisfaction, announcing that there was inflammation on the left brain, which was coming out through the left eye. The treatment consisted in boiling an egg, cutting it into two parts, taking out the yolk and binding the white onto the sore eye with the hollow side toward same, the prognosis being that the eye would surely get well, but not until the inflammation had all found its way out of the brain through that channel. The next day it was very much worse, but he consoled the mother and friends with the advice that all was well; the inflammation was leaving the brain more rapidly, "don't you see," and as soon as it was all out the eye would get better. On the third day the eye was in such a condition from having so much brain inflammation passing through it, that the father concluded that it was time to take matters into his own hand, so he fired Mr. Quack, egg and all, caring for the eye himself that night, and in the morning was rewarded by seeing the congestion rapidly disappearing;—that being a case of being called to take charge of a case just as it was getting better and the new doctor getting all the credit.

A lady friend, stopping with the family, had been talking of consulting me about her eyes, but when she found such talent close at hand, (a foreign doctor, an ex-professor), "I was not in it," if I may be pardoned the slang. He proceeded in the same unique manner to test her eyes for glasses, bringing into play, very effectively, the pleximeter and hammer, and discovering that she needed one kind of lens for one eye and another for the other, by the various sounds he seemed to hear. It was not necessary for her to read or for him to ask her age; he knew at once the proper glass. In a couple of days he would bring them to her, as he must grind them especially to fit the sounds he heard when percussing her head. The ladies were very much impressed by his manner of doing business, and considered him a remarkable man. He issued a circular fully as ridiculous as the former man did, and along with it he refers to a number of prominent merchants, lawyers and judges, giving their names in full, to whom he has fitted glasses. The incongruity of a prominent federal judge's name being coupled with such ridiculous statements about optics and the eye is appreciated by anyone but little posted on either subject.

How people can be fooled by such humbuggery is more than one can understand. It certainly shows that many times we need some protection in some way against ourselves. Can one read of these things and doubt the wisdom of being severe on such sharks? These are not isolated cases and exaggerated, for not a week passes that I do not get new and astounding proofs of this evil.

The Refractionist.

A Journal of Practical Ophthalmology.

FRANCIS F. WHITTIER, M. D., Editor.
74 Boylston Street, Boston.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.
Address all communications to the Editor.

Optical Schools. Judging from advertisements noticed in a recent exchange, one might infer that optical schools were one of the existing fads. We can see how a business firm dealing in frames and lenses might establish such a school in order to attract customers, regardless of the damage it might do by sending out unscrupulous two weeks' representatives to prey upon the public, but when an M. D. begins to cater to an uneducated class, lending his influence to support similar schools, giving short courses to Tom, Dick and Harry, it appears to us that either such a physician's elementary, yes, professional, education is rather weak or that he possesses a lack of professional spirit. As an outgrowth of the recent advances in refraction work and the accompanying idea that there is a mint in it, a class of persons, evolved from the old-time opticians, also jewelers and others acting on the principle that fools rush in where angels fear to tread, are claiming that refraction is a department like dentistry, and that one need not be a physician to master it. This delusion can be suppressed only by an enlightened public and the vigilance of the medical profession. There can be no half-way ground. Our post-graduate schools are striving to supplement the lack of teaching the subject of refraction, which in the past has been crowded from the courses in our schools, or not deemed of sufficient importance until recently to demand special recognition. A little over a decade of post-graduate work in this country has done much for the profession. For the most part, this class of teaching, both public and private, has been confined to physicians, its legitimate field. To any one at all conversant with the enormous field opening to oculists, the need of schools devoted mainly to refraction work is apparent, to disseminate among physicians more knowledge of the anomalies of refraction, their detection and treatment. But when physicians undertake to instruct those non-medically educated

the science of refraction, and thus lend their influence to encourage the use of such instruction, they place themselves in an uncoveted position in the profession. The excuse that some of them make is that all our post-graduate schools, hospitals and clinics are loaded with cliques, who in a more ethical way, perhaps, are demoralizing the profession. Two wrongs, however, will not make one right. Because the mass of physicians holding appointments in our eye infirmaries and clinics do so, under the guise of charity, to directly or indirectly increase their practice, is no reason why others should lend their influence to throw open wide the doors and encourage those having no medical education to deal with medical matters. Optical instruction is all right, gentlemen, but do have enough respect for yourselves and the profession to admit only medical men to your valuable lectures. A little knowledge is a dangerous thing, and when in the future you hear some master of optics (M. O.) who is such an ignoramus as not to realize that he knows nothing of refraction, discussing cycloplegics and his wonderful results in the treatment of functional nervous diseases, you can "fold the draperies of your couch about you and lie down to pleasant dreams," that you have not been guilty of aiding and launching such specimens on a confiding public.

* * *

Refraction Topics.

The Ophthalmological section of the American Medical Association begins in Baltimore at 2 o'clock P. M., May 7th, 1895, and continues four days. Among the subjects promised we notice the following of interest to Refractionists: ANISOMETROPIA,—W. F. Southard, M. D., San Francisco; Practical points gained in the treatment of one thousand cases of insufficiency of the ocular muscles,—J. W. Park, M. D., Harrisburg, (both associate editors of THE REFRACTIONIST); LATENT ASTIGMATISM,—W. H. Starkey, M. D., Chicago; Report of committee on the scientific and hygienic value of examining the eyes in the schools,—Alexander Randall, M. D., Chairman, Philadelphia, W. F. Southard, and others; A study of the refraction of one thousand five hundred eyes,—H. Bert Ellis, M. D., Los Angeles; Two thousand five hundred cases of ocular headaches and the different states of refraction connected therewith,—W. F. Mittendorf, M. D., New York; To what extent should recently suggested methods of muscular exercise displace tenotomy in the treatment of heterophoria?—Hiram Woods, M. D., Baltimore; Various five-minute papers on operations on the ocular muscles; Also, some thirty other papers are promised on kindred topics.

Selections.

The Growth of Ophthalmology. The Philadelphia *Polyclinic's* editorials contain more practical information on ophthalmological topics than any other general medical journal that we receive. The following, signed by E. J., which we interpret Edward Jackson, M. D., is from the issue of March 23d:

The growth of ophthalmology as a medical specialty is sometimes regarded with an incredulity and cynicism that would disappear before a better understanding of its causes. If one regards the phenomena as natural and honestly looks for them, adequate causes are not difficult to discover.

In the first place, medicine is developing into a group of specialties. It is to be hoped that these are not to fall asunder, but will preserve the most intimate connection with one another. Still the process of differentiation is going on. Even the so-called "general practitioner" is disposed to narrow his work, by letting alone the so-called "specialties," and too often is quite content to remain in ignorance of important advances made in the latter. This process of differentiation throws the recent increase of ophthalmic practice into sharp prominence.

The invention and application of the ophthalmoscope was properly a cause of greatly increased and extended activity in ophthalmology. The new instrument revealed a whole new series of clinical facts to be dealt with, and facts of the highest order of importance. The mass of physicians having been slow to acquaint themselves with the use of the ophthalmoscope and to deal with these facts, the greater part of the gain to the profession through this invention shows itself as a gain for the specialty.

We say that these new clinical facts are of the highest importance, and this is true both because of their definiteness and certainty, and because of their wide relations in the domain of general pathology. The significance of an optic neuritis, or an albuminuric retinitis is at the same time more definite, and wider than that of many of the most characteristic symptoms exhibited by other organs, because these symptoms are objective, and because of the wide relations of the parts involved. With the ophthalmoscope one views a living terminal circulation going on in a portion of the living nervous system, and views it, moreover, under a

magnifying power of some fifteen diameters, which renders visible the more minute changes in the smaller arteries and veins, and the deposit and changes of minute masses of exudate. Through this means we come into closer view of physiologic and pathologic processes during their actual progress in the living body than is afforded by any other.

But the most important reason for the growth of ophthalmic practice is unquestionably the increase in those disorders that it has to deal with.

As a malarial region requires physicians with quinine; as an army in active service needs surgeons with bullet probes, anesthetics, operating instruments and bandages, so a time characterized by the unparalleled over-use and abuse of the eyes demands doctors with trial glasses and ophthalmometers, and every method and resource for the study and correction of ocular defects. The time we live in is a time characterized by the over-use and abuse of the eyes. One who has not especially reflected on the subject can have little conception of the extent to which this is the case.

Let it be remembered that the process of evolution by which the human eye has been shaped is an enormously slow one; and that it adapted the eye for the requirements of savage life—perfect distant vision to be sustained continuously for a large part of the time, with commonly less important brief periods of near-seeing. The vision of the savage warrior, or hunter, is no longer required by the mass of civilized men, while the demand for continuous and accurate near-seeing is relatively enormous, and rapidly increasing.

But two generations have lived since the idea was accepted that every child ought to have a "common school education." In a single generation the circulation of daily and other newspapers has increased one thousand per cent, and cheap literature, as popular fiction, and the enormous cheap editions of standard books, has come into existence. Labor-saving machinery, so called, has, by saving or replacing the labor of the hands, enormously increased the output of goods of all sorts, and, in many departments of industry has correspondingly increased the work of the eyes. If one takes a list of the occupations followed in a great city, he will be surprised to find how many there are requiring accurate and continuous near vision that have only within a single generation became fixed occupations for any important number of workers.

To this increase of eye work and radical change in its character must be added the injurious influence of the extension of hours of eye work by artificial lighting, a thing unknown in savage life, and the impairment brought about by crowding in the daylight illumination of cities. Furthermore, these excessive and abnormal requirements having once

weakened the eye, it becomes an organ of selection for the manifestation of the effects of all sorts of general or diathetic weakness.

Especially from its extensive and intimate relations with various parts of the nervous system is the eye apt to become a center for morbid nerve actions. Of the twelve pairs of cerebral nerves, six are distributed partly or wholly to the eye and its appendages; while visual sensations and the movements of the eyes are closely co-ordinated with every center of special sense or movement of the body.

Through its flood of sensations, continuous through waking hours, and only obtained and rendered distinct by the equally continuous use and adjustment of a delicate and highly complex motor-apparatus, this organ, of marvelous but finite capacity, offers the readiest channel for the exhaustion of the general nervous system, or for interference with the balance of its operations.

It is natural that the mass of the profession, very imperfectly instructed as to the diseases of the eye, and regarding them as outside the ordinary scope of the physician's work, should come to greatly under-rate their importance and fail to perceive and appreciate its rapid increase. But none the less is such ignorance of a great branch of medical science to be deplored and remedied. It is to be hoped that the recent reorganization of the course of medical study, in which ophthalmology has received better recognition, will, with the increase of those engaged in its practice and their efforts to attract the attention of the general practitioner in their direction, bring about a better understanding of the subject. To secure the best results the ophthalmologic specialist should be one who has previously enjoyed wide experience in general medicine. E. J.

* * *

Tenotomy of Eye Muscles for Epilepsy.

Dr. Wood (*N. Y. Med. Jour.*) concludes that heterophoria in some form, latent or manifest, can be shown to exist as an ocular condition in fully ninety-five per cent of all individuals. Alone and when associated with ametropia, it is not an uncommon cause of so-called asthenopia. In the latter case, the correction of the accompanying refractive error in the large majority of cases relieves all the symptoms set up both by the ametropia and muscular anomaly; when it does not, the heterophoria may be said to be responsible for the asthenopia.

It is highly probable that when epilepsy is in part or wholly the result of eye strain other evidence of the latter is present. It must follow from the foregoing that in the eye treatment of epilepsy of any decided

degree, the correction of the ametropia, and not the correction of the heterophoria, is the first and most urgent duty of the ophthalmologist, and that in cases where both are corrected at the same time it is fair to suppose that the results, if any, are due to the ametropic correction.

In cases of epilepsy with heterophoria and ametropia, or where the correction of refractive errors has failed to relieve the asthenopic symptoms and the production of orthophoria is followed by cure of the epilepsy and the asthenopia, it is just to say that the operation on the eye muscles or treatment of them has produced the effect of stopping the convulsions.

In the absence of ocular symptoms, apart from the epilepsy, an operation upon the eye muscles stands in the same therapeutic relation to a cure or relief of the disease as do other surgical procedures that have, during the past century, been in vogue, such as tracheotomy, setons, ligature of the vertebral arteries, trephining, oophorectomy, circumcision, castration, the actual cautery, the resection of scars, and so on. These operations bring about a cure or relief of the epilepsy (both idiopathic and hystero-epilepsy) by their powerful mental effect upon the patient—a truth long recognized by neurologists.

Genuine cures of epilepsy by eye treatment of any kind must necessarily be confined to those cases where a faulty ocular apparatus acts as a peripheral irritant. It remains yet to be shown that anomalies of the extrinsic muscular portion of that apparatus are to any large extent responsible for the seizures of epilepsy.

The eye treatment of epileptics who present signs of ocular distress has not received that attention which the importance of eye strain in the category of reflex irritants seems to call for. The eyes should be carefully examined in every case of epilepsy where asthenopic symptoms are present or are suspected.

He questions the wisdom of encouraging the profession, and through them the laity, to believe that every case of idiopathic epilepsy is a suitable one for eye treatment, but prefers to say that only those cases are fit subjects, in the proper scientific sense, for eye treatment whose visual organs are palpably the source of irritation, giving rise to symptoms generally included under the term eye strain.

That when all remedies fail, some operation, easy to perform, perfectly safe, and yet of a severity and character tending to make a lasting impression on the patient's mind, is indicated. He would suggest the removal at intervals, of small pieces of skin from various parts of the body, the denuded spots being allowed to heal by granulation.

Massage of the Cornea.

The value of direct massage of the cornea as an agent in the treatment of corneal opacities is discussed by Dr. Morton in the *Medical News*. The cornea is rendered insensitive by a ten-per-cent solution of cocaine, which, at the same time, by its action upon the corneal epithelium, facilitates the entrance of the drug used. The head of the patient resting upon the knee of the surgeon, the eyelids are separated with the thumb and forefinger of the left hand and the massage-spoon is held in the right. The cornea is gently rubbed alternately in a circular and radiating manner from one to three minutes, and this is repeated as often as is indicated in the individual case. It is to be remembered that the uvea, or region just external to the corneal limbus, nourishes the cornea, the lens, and the vitreous, and is the great lymph-producer for the eye, particularly the anterior segment. For this reason the author desires to lay stress upon the fact that these movements should not be confined to the area immediately adjacent to the opacity, but should be applied, not only all over the cornea, but also in the ciliary zone upon sclera.

After the massage has been practised, he kneads the globe with the thumbs of his two hands, carefully but thoroughly. By following out this plan the lymph-channels are thoroughly opened and the activity of the lymph-currents increased. This in itself is not only a means of dissipating the opacity, but allows the medicament used an excellent chance for action. In massage through the lids, as spoken of by various authors, it is impossible to obtain the effect in a satisfactory manner, and for two principal reasons: in the first place, the manner of applying massage through the lids to the cornea, or any portion of the anterior ocular segment, is a "blind" one. It is impossible for the operator to tell at just what point he is applying the massage. Again, the method is indirect, and cannot be as efficacious as when the massage-spoon is employed. This instrument the writer devised about a year and a half ago, and he has used it continuously in suitable cases since. It is so arranged that the cornea is thrown into very small furrows, and it will also be noticed that any ointment used is held nicely between the forks, and can thus be "worked into" the cornea during the massage. He has found this form of treatment of value in the deep forms of scleritis when used with the ointment of yellow mercurous oxide, and he has used it in the infiltration constituting interstitial keratitis, but he is not yet ready to speak with any authority as to the result.

In pannus this procedure has been partially efficient, and in one case vision was recovered to a remarkable degree. It must be borne in

mind that this treatment is adjuvant simply, without any marvelous power; that it is rational in its action must be obvious; that it has yielded satisfactory aid in the treatment of corneal opacities in his practice he is sure.

In opacities following non-inflammatory conditions of the cornea it is of little avail, for here we have to deal with very different conditions. He is confident that it is far superior to massage through the lids; and the protection rendered the lens by the aqueous humor, and the necessary skill of the operator, make the danger of injury to the lens very slight indeed.

* * *

Oblique Astigmatism.

At the Eighth International Ophthalmological Congress, Dr. Savage read a paper on the relation of oblique astigmatism to the oblique muscles of the eyes, and gave practical demonstrations of the principles for which he contended. This subject is so new and its importance seems so great that quite a full abstract is hereby submitted.

The simple function of the oblique muscles is to counteract the torsion effect of the action of the superior and inferior recti and also of the external and internal recti, if by malposition these are inserted too high or too low. In other words, their function is to keep the normal vertical meridian of one eye parallel with that of the other in obedience to the law of corresponding retinal points. In oblique astigmatism the retinal images are distorted and in obedience to the same law the oblique muscles are further brought into action to harmonize the retinal images. Thus, when the meridians of greatest curvature diverge above, the inferior obliques make the effort to harmonize the images, and when they converge above, the effort falls on the inferior obliques.

In applying a cylindrical glass for the correction of astigmatism, whether myopic or hypermetropic, there is in every case an arc of distortion for the superior obliques and also an arc of distortion for the inferior obliques. These two arcs always make 180°, but are not always equal. They are equal only when the axes of the cylinders are required at 90° or 180°. For plus cylinders the arc of distortion for the superior obliques is always wholly or in greater part in the lower temporal quadrant, while the arc of distortion for the inferior obliques is always wholly or in greater part in the lower nasal quadrant. The reverse is the case with the minus cylinders. The arc of distortion for the superior obliques is not always equal to the arc of distortion for the inferior obliques, but the one always supplements the other, so as

to make 180°. To illustrate: if the arc of distortion for superior obliques is 120°, that for the inferior is 60°. The point of maximum distortion in either of these arcs is just 45° from the vertical. The practical feature of this matter resides in the fact that we have within our power, by temporary rotation of cylinders, either plus or minus, in the proper arc from 5° to 10°, to relieve the patient of metamorphopsia and other uncomfortable symptoms which are so common in the great majority of cases of oblique astigmatism. Gradually these cylinders must be rotated back to the proper point, when the patient will remain comfortable. This is of special importance in cases where the obliques are insufficient. As the author of the paper has before stated, insufficiency of the superior obliques is a very common condition; therefore, whenever oblique astigmatism is such as to call into activity the inferior obliques, it becomes a matter of very great importance in correcting this condition, to resort to the rotation of the cylinders so as to gradually transfer work from the inferior to the superior obliques. To illustrate: We have a case of hypermetropic astigmatism of 2°, the meridians of greatest curvature converging above. This uncorrected astigmatism distorts the images so as to throw a greater amount of work on the inferior oblique muscles. Correct this astigmatism by a plus cylinder, the distortion is at once reversed and the work to which the inferior obliques have been accustomed is at once transfered to the superior. The latter being weak, they do not take this extra work kindly. By revolving the axes of these cylinders towards 90° for each eye, through an arc of 5° or 10°, the images are distorted in the same way that the astigmatism itself distorts them, but objects are seen more sharply than if the lenses had not been given. This artificial distortion, while sharpening the images, leaves an excessive amount of work to be done by the inferior obliques. Gradually the cylinders are revolved back to their proper positions, and in this way, by small degrees, the work is transferred from the inferior obliques to the superior.—*From Dr. Hubbell's Abstracts in Buffalo Medical Journal.*

* * *

Javal's Ophthalmometer.

Why are the results of this instrument sometimes "deceptive?" It is not the fault of the instrument, for this gives accurately the lined picture it is intended to give. It measures accurately enough the corneal astigmatism, and did the astigmatism lie solely in the cornea, we might dispense with atropine and with all other instruments than that of Javal, or one of its modifications, in our detirmination of this part of the refractive error. Unfortunately, however, for instruments intended to measure only the outer curve of the eye, there exists

a lens, which consists of two parts, cortex and nucleus. In making this division of the lens, I do so from purely a refractive point of view. In this connection, then, the cortex represents that part of the lens which responds to the action of the ciliary muscle in the act of accommodation; the nucleus, that part naturally the central, which remains fixed and immovable in the act of accommodation.

It is, then, because there exists such a thing as lenticular astigmatism, that Javal's instrument and all modifications of it give, in a proportion of cases, so-called "deceptive results." Lenticular astigmatism exists in a much greater proportion of eyes than ophthalmologists seem as yet willing to admit. In cases where lenticular astigmatism exists, the use of a mydriatic is indispensable. To know the true refractive condition of the eye, we must find it when the eye is at rest.

The refractive power of the lens while accommodation is going on, and the refractive power during the complete suspension of accommodation are two different things. The latter represents the true refractive condition of the eye, and should be the basis of our prescriptions for glasses. With Javal's instrument, the corneal astigmatism may be measured, and when this instrument is carefully adjusted it does its work admirably. In some cases, when the corneal astigmatism has been determined, and glasses are ordered, our patient will not wear them. Why? We have not taken into consideration the lenticular astigmatism, which cannot be determined by any ophthalmometer measuring the corneal surface alone.

To determine the amount of lenticular astigmatism, we suspend the accommodation, and have recourse to retinoscopy. By this means we may measure, in most cases, the refractive power of the two chief meridians of the lens. At times we are surprised at the results thus obtained, for we may have a cornea, one of whose meridians is myopic, while the refraction of the corresponding meridian of the lens at rest is hyperopic as much as 1 D. Again, there may be one degree of hyperopic astigmatism for the cornea; another for the lens. Again, while I have found in the majority of cases of lenticular astigmatism that the axes were at 90° and 180°, this is not always the case; the main meridians of the lens at rest may differ from those of the cornea. Retinoscopy, in the majority of these cases, is able to determine, with great accuracy, *i. e.*, to less than $\frac{1}{4}$ D., the refractive power of the main meridians, and to distinguish between corneal and lenticular astigmatism.

Many of these cases of lenticular astigmatism require much time and care to work out, even with retinoscopy, which, however, is at present the only means, known to me, of determining with any accuracy the refractory condition of the lens. In a certain proportion of these cases of lenticular astigmatism the nucleus of the lens can be shown, by retinoscopy, to be astigmatic. Hence, while in those cases in which the astigmatism is purely corneal, Javal's instrument represents a great advance in accuracy and saving of time, there remains still not a small per cent of the cases of refractive errors where the results obtained by this valuable instrument are too much at variance with the actual state of affairs for it to be relied upon.—*J. Dunn, M. D., in Virginia Medical Monthly.*

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. MAY, 1895. NO. 2

SCOPOLAMINE AS A MYDRIATIC.

BY ARTHUR G. HOBBS, M.D., ATLANTA.

September, 1894.

THIS new mydriatic is being tested now by a few oculists, especially by those who are in charge of large clinics where it can be conveniently alternated with atropia, homatropine, etc., and the results compared. It seems at present to occupy a middle ground between atropia on the one hand, which is known to produce a complete paralysis of the accommodation and retain its effects for a week or ten days, and homatropine, which is claimed by some, and denied by others, to effect a complete control of the accommodative muscles and retain its effects only twenty-four to forty-eight hours. In the first case the time necessary to accomplish a full paralysis ranges from two and a half to three and a half days, and in the second only sixty to ninety minutes, according to its advocates.

Scopolamine requires about one hour with intervals of ten to fifteen minutes between the instillations, according to my observations, to bring about the desired results, and so far as I have been able to decide by comparative tests, the full effect is then reached quite as completely as that produced by a three days' use of atropia. Its paralysis lasts from two to three days, so it occupies a place between these two leading mydriatics, both in the time of reaching its maximum effect and in the time of its complete decline. The above comparison is based upon the assumption of the advocates of homatropine that this drug produces a complete relaxation of the accommodative muscles in one to one and a half hours, the truth of which I am not yet fully prepared to accept. In the same proportion that atropia is used, in a one-half to one per cent solution (approximately two to five grains to the ounce), and homatropine in a one per cent solution (about four to five grains to the ounce).

so scopolamine is used as a rule, in solutions of one to two and a half grains to the ounce, 1-5 to 1-2 %, although I now prefer it in weaker solutions. It should be dropped into the eye at intervals of ten to twenty minutes until four or five instillations have been made, when it may be assumed that complete paralysis of the accommodative muscles has been reached.

It has served me thus far in such refractive tests that have required complete paralysis of the accommodation quite as well as atropia, and while it does its work much more quickly, its decline is at most only about one-fifth and oftener one-sixth of the time required when atropia has been used. (Homatropine would be the mydriatic, however, if we could become convinced that it effects a complete paralysis of the accommodation in one hour, or even in twice that time, since there can be no question of its more rapid decline.) Scopolamine produces no unpleasant effects in the throat, and it allows a possible accommodation within a day and a half or two days after its instillation, although the pupil may not become normal for a day or two longer.

Great comfort may be extended to the patient, particularly if he should be a business man with few hours to lose from his work, by prescribing a weak solution of eserine (one-eighth grain to the ounce) in order to more rapidly reduce the size of the pupil and indirectly aid the restoration of accommodation.

Some have asserted that scopolamine does not increase intra-ocular tension, but its use has not yet been sufficiently extensive to fully warrant this statement. Should this be true, scopolamine would possess a great advantage over atropia, especially in older subjects. In some phlyctenular forms of keratitis, as well as iritis, when occurring beyond middle age, it seems particularly efficacious; indeed I have already learned to place more confidence in it and feel safer when using it in such cases. Although it is much less expensive now than when I first began its use, about a year ago, its cost still restricts its general use.

We may hope that the consensus of opinion will, in a year or two, furnish us with a more accurate knowledge of this drug, to indicate to us when and in what case it is preferable to atropia or homatropine. It is my opinion that it will in many cases supercede the first, and entirely supplant the last, unless homatropine should prove itself equal to the occasion now claimed for it. In this latter case homatropine would supercede both atropia and scopolamine for refraction work, and leave a very narrow field of usefulness for the latter. Since the contingency still exists, however, we may continue to use scopolamine, particularly where we fear atropia, as well as in all refraction work.

I have a feeling based upon my short experience in the use of this drug, that there is something more for us to learn about it as a mydriatic.

* * *

April 15, 1895.

The above paper on scopolamine was based mainly on what I learned of it in my refraction room during the first half of 1894, since which time Dr. Patterson has come to my assistance and together we have learned much more of this wonderfully potent drug. Hence we add the following:—

Since writing the above notes on scopolamine we have had a more extended experience in its use, and the following notes are on its effects upon the muscles of accommodation. We have used it in our refraction room almost exclusively in cases where atropia was not particularly indicated, during the last eighteen months, and we find it in some very important particulars a more desirable agent than the other popular mydriatics; first in the small dose necessary, second in the few minutes required to produce complete paralysis of accommodation, and third in the comparative short time of its decline. At first we used the stronger solutions of one-half and one-fifth per cent, but more recently we have used the weaker solutions of one-tenth, one-twentieth, one-fortieth and one-eightieth per cent. By all the comparative tests, the latter prove as effective and the results are equally as reliable, as those produced by the stronger solutions, or by either atropine or homatropine.

We have used a weak solution in some cases of glaucoma, with very small pupils, in the early stages, in order to more thoroughly examine the retina. We ran the risk in these cases, because in no instance had we ever been able to observe any increase in the tension after the use of scopolamine. This effect did not follow in either of these cases, but on the contrary one insisted that the characteristic deep feeling of pressure was relieved by each instillation, more than when eserine was instilled. Great care should, however, be exercised in putting this drug into a glaucomatous eye until we more fully understand its great potencies. In all cases solutions of this drug should be dropped on the cornea with the head reclining towards the temple side of the corresponding eye, to avoid drainage into the nasal duct. A one-half or a one-fifth per cent solution may produce a toxæmia if such care is not observed. The toxic symptoms are expressed in low mutterings with a blank expression of the face. In all muscular movements, coördination is impaired. There is more or less staggering in walking, at times simular to alcoholic intoxication, though no uncertainty is manifested, as in locomotor ataxia; the result is a surprise. The senses seem to lose the position of objects

in space; the fingers grasp at an object and fail to find it, yet appear to possess it. This incoördination is closely allied to subsultus tendinum. Not many other symptoms show any close resemblance to alcoholic intoxication. Memory is sluggish and often seems entirely suspended; perception of the immediate surroundings is dulled, though the wits are sharpened, and sometimes there is a decided tendency to hilarity throughout the whole toxæmia. These symptoms may last from four to six hours, unless stimulants are administered during the time. Opium and whiskey are antidotal, and when resorted to early cut short the toxic effects.

In some cases of iritis when atropia has failed to produce sufficient dilation of the pupil, we have found that solutions of scopolamine have accomplished the object. In older subjects with iritis such advantages can scarcely be overestimated. We have had some further experience in its use in keratitis and now would use it with still greater confidence than in the first cases.

The following cases are from our refraction book:

Nov. 24, '94. N. A. age 10, R. & L. 20/15.

Scopolamine, two instillations, one drop each of a one-fifth per cent solution, at intervals of fifteen minutes; test made one hour after first instillation.

R. & L. 20/70 = 20/15 w + .75 ⊂ + .50 C. Ax. 90.

Nov. 26th, R. & L. 20/20 = 20/15 w + .75 ⊂ + .50 C. Ax. 90.

R. Jaeger No. 13.

L. " No. 14.

Ordered + .50 C. Ax. 90 both.

Nov. 27th R. & L. Jaeger No. 1.

Dec. 1, 1894. C. G. B. age 30.

R. 20/30 = 20/15 w + 1 ⊂ + .50 C. Ax. 180.

L. 20/20 = 20/20 w + .50 ⊂ + .50 C. Ax. 180.

Scopolamine one-fifth per cent, three instillations of one drop every fifteen minutes. At the end of one hour the test, which was repeated several times during the day without variation, was:

R. 20/200 = 20/15 w + 4 ⊂ + .50 C. Ax. 180.

L. 20/50 = 20/15 w + 1 ⊂ + .50 C. Ax. 180.

On the fourth day accommodation was restored.

Ordered R. + 3.50 ⊂ + .50 C. Ax. 180.

L. + 1 ⊂ + .50 C. Ax. 180.

As a proof test we made the following nearly four months after the above, in the case of Mr. B's R. E.

1895, March 22nd. 9.40 A. M., scopolamine, one drop of a one-eightieth per cent solution, was instilled in the right eye. 9.50 A. M. one drop, 10.30 A. M. one drop.

10.45 A. M. 20/200 = 20/15 w + 4 ⊃ + .50 C. Ax. 180.

Jaeger No. 1, w + 8.50 ⊃ + .50 C. Ax. 180.

No reduction in spherical for Jaeger No. 1 at nine inches.

March 24th, 11 A. M. Jaeger No. 1 w + 1.50 ⊃ + .50 C. Ax. 180.

" 25th, 10 A. M. " No. 1 w + 3.50 ⊃ + .50 C. Ax. 180.

Accommodation restored on this day and same glass retained in right eye with perfect satisfaction.

Jan. 16, 1895. M. B. age 16, R. & L. 20/15. Jaeger No 1.

Scopolamine, two instillations, one drop each of a one-fifth per cent solution; test made one hour after first instillation.

R. 20/50 = 20/15 w + 1.50 ⊃ + .50 C. Ax. 65.

L. 20/70 = 20/15 w + 1.75 S.

Jan. 19th. R. 20/30. L. 20/30.

" 20th. R. 20/20. L. 20/20.

" 21st. R. 20/15. L. 20/15. R. & L. Jaeger No. 1 at proper range.

" 21st. Ordered R. + 1.50 ⊃ + .50 C. Ax. 65.
L. + 1.75 S.

April 5th no return of headache.

It must be remembered that the drop from a small pipette used in dropping these solutions of scopolamine on the cornea is less than one-half and probably not more than one-third of a minim of water. Hence in the case where only three drops of a one-eighth per cent solution was used, only one or at most one and a half minims produced complete mydriasis. One drop contains 1/4000 to 1/6000 of a grain. Are there many drugs that can under any circumstances display such a potency? Yet we are not sure that a solution of one-half the above strength will not produce the same results. We will continue to reduce the strength until we find the minimum amount that will quickly produce paralysis of accommodation.

This great potency has prevented the drug from being used in the clinics as much as was first expected, hence we are still unable to add the experience of others to our own.

In answer to Dr. Hier's fears of resorting to mydriatic in glaucoma and to his predilection to cocaine for dilating the pupils, I must say: There is nothing more natural than that one should have the preconceived idea that an increase of tension would follow a paralysis of

accommodation. But upon what is such an idea based? Is it because atropia does it? But why should scopolamine produce this effect — because atropia does it? As a matter of fact this new mydriatic does not increase intraocular tension. I will acknowledge, however, that it was with a great deal of temerity that I risked it in a glaucomatous eye the first time. I did it in the acute stage, where the pupil was small and I desired to see the fundus and also verify, or not, whether so small a pupil could exist in a case of glaucoma. I had never seen an increase of tension from any solution in any of my test cases, still I do not wonder at the doctor's fears that it would produce an increase of tension, as I did myself, simply because we know that atropia does it, yet there is no real parity of logic that should enforce such a conclusion. Even from a therapeutic standpoint, I cannot think, granting the fact that it dilates the puptil more rapidly than atropia, which I do not believe, although it paralyzes accommodation in two per cent of the time, that the effect upon the iritic angle could, as has been suggested, cause this difference in the infiltration. Indeed, such an explanation would be unwarrantable, and we are compelled to fall back on our old "dernier resort" in therapeutic logic, and say: "This is its peculiarity;" "This is its selective property," not to increase tension; as eserine selects to paralyze the radiating fibres of the iris, and atropia to do the opposite, by paralyzing its sphincter muscle.

* * *

Golden Wedding.

The Buffalo *Medical Journal* soon celebrates its golden wedding by increasing its reading matter from 64 to 80 pages and by making other improvements, that will tend to keep it abreast of the times. The ophthalmological department is well looked after by Dr. Hubbell.

* * *

Free of Charges.

The therapeutical applications of Peroxide of Hydrogen (medicinal), Glycozone and Hydrozone, by Charles Marchand, Chemist. Ninth edition.

This book of 200 pages, which contains all information on the subject, with reprints of elaborate articles by leading contributors to Medical Literature, will be mailed to doctors mentioning this publication.

Send full address to Charles Marchand, 28 Prince Street, New York.

The Refractionist.

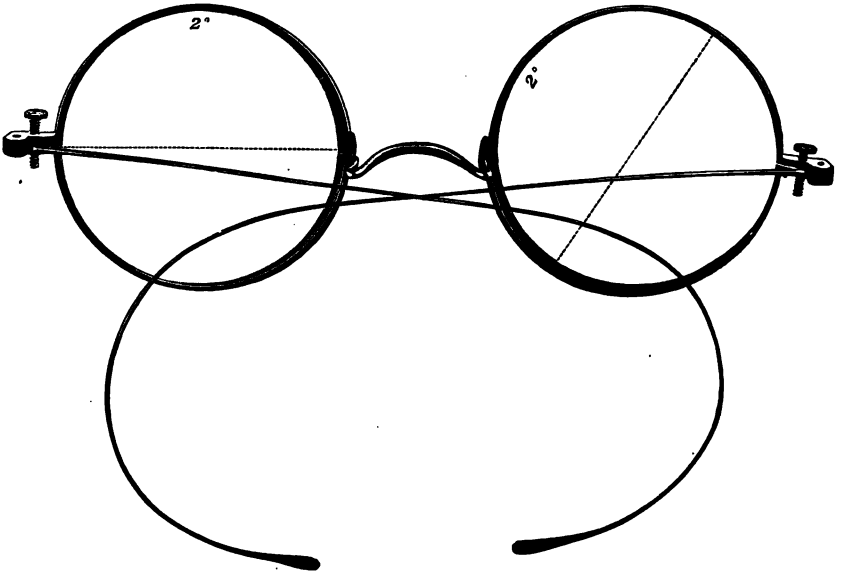
A Journal of Practical Ophthalmology.

FRANCIS F. WHITTIER, M. D., Editor.
74 Boylston Street, Boston.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.
Address all communications to the Editor.

Interchangeable Prisms.

Some time ago we called the attention of the profession to the convenience of having prisms mounted in circular frames, for the temporary use of patients, and we wish to again remind oculists of this arrangement. If we mistake not we are all accustomed to prescribe prisms for temporary use, and many find it convenient and profitable to furnish these prisms to patients, to assure ourselves of their value before permanently prescribing them.



As will be seen by this cut, a prism can be placed with the apex in any direction, by loosening the screws at the sides, and revolving the lens. We keep a large number of these frames on hand,—of different widths, and heights and shapes of nose pieces,—containing prisms of various numbers.

W. E. BAXTER.

REFRACTION IN SCHOOLS.

EXTRACT FROM A PAPER READ BEFORE THE MINNESOTA ACADEMY OF MEDICINE, FEB. 6,'05
BY FRANK ALLPORT, M. D.
[Reprint from The Journal of the American Medical Association.]

CONSIDERATION must now be turned towards those conditions of school life which encourage and perpetuate the production and spread of myopia, and the first item that claims attention is that children should not be placed in school at all unless their general health is sufficient to endure the strain. It is unnecessary and space does not permit me to impress upon physicians the importance of this assertion, and the large influence exerted upon the eye by the general condition of the patient; but it is unquestionably imperative that we, as medical men, should emphasize the truth to the laity, and especially among those families committed to our care. We are, at present, dependent upon personal influence and the intelligence of those people not medically educated, to exclude from our schools those children not physically prepared to enter; but the time should and undoubtedly will come, when every scholar will not only be compelled to show a doctor's certificate before entrance, but will find it necessary to produce a similar document at the beginning of every school year.

What, then, are those conditions of school life which directly aid in the encouragement and perpetuation of myopia. First of all, the building itself should be so constructed as to present as few obstacles as possible to the proper exercise of the ocular function, and to give the pupils all the advantage possible in the way of location, space (inside and outside), heat, ventilation, plumbing, general cleanliness, water, basins and soap.

The building should be lighted properly and sufficiently, as there can be no question that a paucity of illumination necessitates a closer apposition of books, which in its turn means increased convergence and an encouragement of myopia. Just seeks to controvert this statement by claiming no decrease in myopia in the new and well-lighted schools of Zittau, in Saxony; but the experience of others will scarcely support him in his position. For instance, in Coburg, Germany, 2,323 children were examined in 1874 and showed an average of 21 per cent of myopia; the same number examined in 1877, after better lighting and seating had been provided, showed only an average of 15 per cent of myopia. De Metz, of Antwerp, found only about 2 per cent of myopia in well-lighted as against 5 per cent in badly-lighted schools. Other statistics, even more striking than these might be produced to show the importance of proper illumination, but it is scarcely necessary as its prin-

ciple must commend itself to the mind of any one who gives the subject even a casual observation.

The light in the school-room should be direct, and not the indirect illumination from the walls of some adjoining building. It must be constant, and dependence should not be placed upon the immediate rays of the sun; for this reason, the windows should face the north. The most remote portion of the room should be bright, even on dark days, to the extent of receiving an illumination equal to ten candle power. Every scholar should, from his place, be able to see some portion of the sky. Light should come from the left, and as high above the scholars as the ceiling will admit. The total window surface should bear to the area of the floor a proportion of 1 to 5, and the panes should be as large as possible. It would be better if artificial illumination was never used, but if it is, a profusion of incandescent electric lights is the best substitute. They should be ample in number, properly shaded and brought sufficiently close to the desk to afford an abundant illumination. This light is much superior to gas, kerosene, etc., as its color is whiter, is capable of uniform distribution and concentration, and does not heat or vitiate the atmosphere.

The question of the construction of seats and desks is one of great importance. Seats should permit each scholar to squarely rest the feet upon the floor, thus favoring a natural and upright position; for this purpose, it will be necessary to provide seats of different sizes for individual pupils, who should be seated according to their height. The seats should have comfortable backs. The desks must correspond in size and have a slightly slanting top, and be far enough away from the head of the scholar (when sitting in an upright position) not to necessitate close approximation of the page of a book. Many seats and desks are so illy constructed for the needs of the individual student, as to just allow the head of the patient to emerge from the top of the desk, thus necessitating enormous convergence when attempting to study. These defects are usually observed in primary departments, where full-sized desks are used by very young pupils. Strict rules are enunciated by Fuchs and others as to the relation which should exist between the desk and seat. Fuchs says that "the proper position is that in which the shoulders and pelvis are parallel with the edge of the desk, and the head upright or bent but slightly forward. As to the construction of desks and seats, there must be several sizes to suit scholars of various ages. The distance between seats and desks in the vertical direction, must be but little greater than the distance between the elbow and the ischial terberosity. The edge of the desk must overhang the seat about two inches; the scholar can then sit upright."

Rohe does not think it necessary for the desk to overlap the seat, but says that "a line dropped from the near edge of the desk should strike the front of the seat."

The object in any event, is, if possible, to prevent stooping, and to compel the scholar to study in an upright position. Various apparatuses have been constructed for the purpose of forcing an erect attitude, but as yet nothing satisfactory and practical has been proposed.

Attention should be given to the distance and location of blackboards, to prevent their being placed at so great a distance from any scholar as to necessitate a strain in order to see, and to carefully avoid a position where rays of light will reflect upon their surface in such a manner as to obscure the characters inscribed thereon. Similar care should be given to the placing of maps, from which scholars from time to time are required to study. Some investigators believe in doing away with blackboards entirely, and substituting therefor white surfaces and black crayons, as black writing on white background can be read at a greater distance than the reverse. The same plan has been proposed and practiced in some schools with slates; white slates and black pencils are used on account of lessened reflection. Good results are claimed. Other investigators believe in ceasing to use slates at all, owing to the glistening surface, and substituting in their stead paper and pencil or pen, the paper to possess a non-glistening surface and be non-translucent.

School books should be of a size easily handled, and the paper should be reasonably thick, of good quality, and have a dulled surface; some authorities think that yellow instead of white paper is to be preferred. The Latin letters are best for all kinds of reading, and it is certain that if Germany would absolve itself from nationalism sufficiently to declare an emancipation from its miserable type there would be less myopia in the Fatherland. The letters should be well-printed, clear, distinct and large. Cohn insists that all books should be prohibited from schools in which smaller type is used than long primer, a less interval between the lines than one-tenth of an inch, a longer line than four and one-half inches, and more than sixty letters to a line.

The question of erect or slanting handwriting is one that is much agitated at present. Ellinger, in the first place, opposes the practice of inclining the copy book to the right instead of straight ahead, feeling that it favors the development of myopia. However this may be, it is certain that there is variety in the opinions expressed relative to the preference as to erect or slanting writing, with the drift of sentiment favoring the former. Berlin favors the inclined writing, but he appears

to be occupying a somewhat isolated position, as a tendency of opinion from Schubert, Manz, Königshoefer, Seggel and others certainly indorses vertical handwriting. It is felt that the oblique system favors myopia by an unnatural position of the head, and by the fact that upright writing is usually clearer and more easily read than the reverse. Continuous work is detrimental to the health of the eye. This can be avoided in the school by often changing from one occupation to the other, as from desk work to recitations, and by frequent intermissions, during which time the rooms should be thoroughly aired. Matais claims that at the Military Prytanæum and at the School of Arts and Industry, at Angers, myopia is relatively rare, although the hygiene is not better than in the colleges, because the interruptions in work are frequent, consisting in manual work, games or active exercises.

Unquestionably much harm is done by indiscretion in ocular service at home. Granting that our directors performed an elimination of all existing school evils relative to ocular hygiene, there would still remain an element beyond their control in the abuses at home. Here we have a recapitulation of all the evils already enumerated in school-life, to which others are added. Provisions are not usually made as to proper desks and seats, light and interruptions in work. Children are allowed much latitude as to what they read, and when and how they read it. Poorly printed novels are absorbed before and after going to bed, in sitting and reclining positions, by any light that happens to be convenient. In view of such abuses which will inevitably exist, especially among the poor and ignorant, the warfare against myopia is not of an encouraging character; but it does not absolve us from pressing the battle whenever the opportunity presents. If perfection cannot be obtained, progress can at least be made, and much benefit will accrue from educating school directors, teachers and the laity who can, in their turn, perform a part in disseminating a knowledge of the subject among those who are less informed than themselves.

As a rule, children are sent to school too early in life, and too little attention is paid to the individual adaptability of the child for school life and its requirements. It is felt that a child must go to school at a certain age, irrespective of his physical condition, and such generalizing of educational methods is frequently followed by exceedingly detrimental results.

Children often go into kindergartens with perfect refraction, and acquire myopia before entering the primary department of the public school. The use of the eyes at a tender age, especially in those children inheriting a myopic, tuburculous or scrofulous tendency, is exceedingly

hazardous. Their tissues are soft, pliable and yielding, particularly where such parental predispositions exist, and the confinement and bad school hygiene, coupled with the desk and eye work incident to school life, unquestionably form a combination of circumstances conspicuously favoring the development of myopia.

Myopia is rare before the eighth year of life. Hypermetropia is the normal refraction of early life. Myopia usually begins about the tenth year and reaches its maximum at about the twentieth year. Statistics show that the less educated the nation, the more cases of normal refraction are found. Hence these early years of life should be guarded from the refining influences of intellectual advancement as much as possible, bearing in mind that it is better to devote our youth to laying the foundation of a strong constitution, and that the rural child, raised upon the farm, with practically no educational advantages until about the fifteenth year, often far outstrips his city rival whose life has been spent in kindergartens and other graded schools.

The question as to what shall be done with these children of perverted tendencies is one of great importance. Shall they be sent to the public school at the average age, to be thrown into the common receptacle, to be assigned the same lessons, and to be treated in exactly the same way as the youth of untainted health and robust constitution? Common humanity unhesitatingly answers in the negative. Such children should rather be allowed to spend their lives in the open air, with a judicious intermixture of properly assigned manual labor. Their early education should be religiously neglected, and every effort should be made to mitigate the unfortunate tendencies of birth by a physical rather than an intellectual life, spent preferably in the country, where the air is good and the surroundings healthy. Systematic study should not be begun until about the fifteenth or sixteenth year, after the body is thus strengthened, and the ocular tissues have grown firm and better able to resist the encroachments of myopia. Even now, it will be better to teach the child at home, or at some private institution, where its student life can be properly controlled.

It may be urged that such advantages are only for the wealthy, and the question may be asked as to what must become of the poor myope. This may be exceedingly pertinent, but it must not be forgotten that the compensations of life are somewhat evenly divided, and that myopia is much more prone to occur among the wealthy and intellectual than among the poor and illiterate; consequently the necessity for such restrictions in the early career of our youth will not so often be required of the latter class.

Can myopia be cured? This is a question which is forced upon us, and must be conservatively answered. When once thoroughly established, and decided organic changes have occurred, the probability is that with our present knowledge of the disease it cannot be cured; it can only he alleviated. That by improved school hygiene, education of the laity, and careful and uniform correction of refracture errors, it is susceptible of material mitigation in a community, is amply proved by the careful and painstaking investigations of Risley and his associates in Philadelphia. But it must ever be borne in mind that the only reasonable hope for even partial emancipation must necessarily rest in prophylaxis, school hygiene, an intelligent coöperation of the laity, and a proper correction of the refractive error by suitably adjusted glasses.

But while the subject of myopia in youths is of signal importance we must not lose sight of another class of perverted refractives, viz., the hypermetropes and astigmatics. These, it is true, do not possess that element of danger to sight found in malignant myopia, where the disease marches on to posterior staphyloma, detached retina and blindness; but it does mean much, in the possible intellectual progress of the individual, and the attainment of those heights of knowledge apparently demanded by modern civilization.

The myopic eye is often a strong eye, capable of performing much work at short range, but the hypermetropic or astigmatic eye possesses attributes quite the reverse, viz., comparative ease in distant service, but great inconvenience for close work. The hypermetropic or astigmatic youth suffers from those various symptoms, such as headache, eye-tire, etc., generally classed under the one term, asthenopia, and which have their principal origin in an overtaxed ciliary muscle. He goes to school, but takes no interest in his studies; he is called idle, because he gives so little attention to his books; he is classed as stupid, from never knowing his lessons; he is thought to be a complainer, because he frequently has headache; he taxes the patience of both teacher and parent, whose wonder is excited when the inane, idle, stupid, fault-finding child is transformed into a wide-awake, industrious, healthy student by the aid of a properly adjusted pair of spectacles. This is an experience common to every teacher or oculist, and the frequency of its occurrence should be an incentive to active efforts for relief on the part of those from whence relief must come. An important matter of this nature cannot with safety be left to the laity to settle, for the laity is frequently ignorant, careless and impecunious. Some means must be devised by which an ocular examination of each scholar shall be a requisite for entrance into a school, and by which a repetition of such an

examination must be made at stated intervals during the scholar's school life. Opinions differ as to the necessary frequency of such tests; some feel that they should be held every six months, and others that annually will be sufficient. Either would be an improvement on the present system, where nothing of the kind is required.

In addition to this, provision must be made by which children who shall be adjudged to possess defective eyes shall be required to produce a proper certificate from a reputable physician, before admission to the school is permitted. Such a specification would exclude work done by opticians, jewelry and department stores, etc.

The ideal method would be to have a competent physician appointed by the proper authorities, whose duties shall be to pass upon the eligibility of all scholars, both upon entrance and at stated intervals. This would, however, be open to certain objections. It would involve a salary which the different boards might be unwilling to pay, and would inevitably impair the efficiency of such a law, by a degeneration into political jobbery. Beside this, the appointee would undoubtedly be distasteful to many pupils or parents, which would constitute an obstruction to harmony and an embarrassment to the examiner.

In case such a method is deemed inadvisable, the next best procedure would be to require of each pupil a proper certificate from a reputable physician, stating the ocular condition of the applicant, with recommendations for relief if necessary. This, again, would be opposed by the people as compelling an ocular examination where it is perhaps unnecessary, thus incurring a useless expense to parents or guardians. It is true that a combination of both of these methods might be adopted, and a law passed requiring that each pupil shall pass an ocular examination by a physician employed by the Board of Education, but leaving it optional with the parent or guardian whether the child shall be passed upon by the school examiner, or taken to a physician of recognized standing whom they themselves shall select. This would be a compromise measure, but would still be open to the combined objections of both procedures in mitigated form.

There is another method of dealing with the subject, proposed by the writer, which may not be considered sufficiently stringent and scientific for enthusiasts on the matter, but which the writer believes to be all that can be accomplished at present and may pave the way for something more energetic in the future. It can be executed at practically no expense to our school treasury, will but seldom cause useless expense to parents and guardians, can be universally applied, and, if thoroughly accomplished, will give general satisfaction.

The idea is simply to have a physician of recognized ability deliver a lecture or talk on the subject to the principals of the city schools, once a year, just preceding the opening of the schools. This talk shall include plain and comprehensive remarks on the anatomy and physiology of the eye, refraction, and how to use but not abuse the eyes in school and home work. It will also instruct the principals how to test the eyes, in accordance with the subjoined scheme. Besides this, printed directions for testing the eyes shall be given to each principal, which might read something like this: —

INSTRUCTIONS FOR EYE EXAMINATIONS.

The examinations should be made privately and singly, in a room apart from the general school session.

Place a card of Snellen's Test Types on the wall in a good light; do not allow the face of the card to be covered by glass.

The line marked XX (20) should be seen at twenty feet, therefore place the pupil twenty feet from the card.

Each eye should be examined separately. Hold a card over one eye while the other is being examined. Do not press upon the covered eye, as the pressure might induce an incorrect examination.

Have the pupil begin at the top of the test card, and read aloud down as far as he can, first with one eye and then with the other.

If the pupil can read XX (20) test type with each eye and does not, upon enquiry, complain of tired and painful eyes or headache, he may be admitted to school; but if he cannot read XX (20) test types with both eyes or complains of tired and painful eyes or headache he should be sent home with a card of information to the parent or guardian.

This card might read as follows: —

MINNEAPOLIS, October 1, 1894.

DEAR SIR: — Your son, John Smith, has been examined by me this day as to the condition of his eyes.

I believe it to be advisable for him to consult a physician of recognized standing, from whom he must bring a certificate, stating it to be wise for him to continue his studies. Some regular oculist is recommended. Without such a certificate he must be denied admittance.

Respectfully, MARY JONES,
Principal of the Douglas School.

This scheme possesses many advantages. The physician selected to deliver the lecture or talk to the principals, would undoubtedly be glad to do so gratuitously, and much useful and practical information could be deducted therefrom, which would react most favorably on the scholars.

The test cards could be procured at a nominal cost, not to exceed twenty-five cents for each school, and the printed cards of instruction for principals, and the cards to be sent the parents or guardians would

cost but little. The expense, therefore, of the entire outfit would be so small as to be unobjectionable.

Then the test is so simple and easily accomplished, that any one of sufficient intelligence to be a principal of a school could soon master it and examine the pupils with such ease and rapidity that a large school could be tested in a very few days. An average of two or three minutes to each pupil would be more time than is necessary, if systematic arrangements were made.

The writer is well aware that such an examination is not ideal and is open to objections; but it is better than nothing, is fairly sufficient, can hardly antagonize interested parties, cannot savor of medical favoritism, involves practically no expense, and is so simple and practical as to commend itself to all parties concerned. In large cities the scholars would unquestionably consult oculists instead of general practitioners, and where the latter *were* consulted the patient would probably be referred to the former. Those not financially situated so as to render it possible to consult an oculist in his office could procure equally good services at some dispensary.

If such a law were enacted in small towns, at least one or two resident physicians would find it profitable to become somewhat familiar with the subject; or children could be sent to a neighboring city for advice; or, if a fair number of cases were to be examined, an oculist could undoubtedly be procured who would be glad to make a trip into the country for a few days to examine defectives in a tier of towns.

The writer believes this to be the only plan for relief that can be procured at present, and as such trusts it may meet with the approbation of those interested in the subject.

* * *

Schneideman's Rule.

Dr. Schneideman finds the following rule for the transposition of sphero-cylinders of opposite signs in mixed astigmatism useful:

Subtract the less from the greater, and prefix the algebraic sign of the greater; the result will be the sphere sought. To obtain the cylinder, *take the original cylinder at opposite sign and opposite angle.*

Example:

+ 1.50 sp. ⊂ — 2 cy. ax. 90, may be transposed as follows:

1.50 subtracted from 2 equals 0.50; the sign of the greater being negative, we prefix that sign to the remainder, which thus becomes —0.50 sp. The original cylinder (— 2 cy. ax. 90) at opposite sign and angle gives + 2 cy. ax. 180, and the new formula is — 0.50 sp. ⊂ + 2 cy. ax. 180.—*Polyclinic.*

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. JUNE, 1895. NO. 3.

PRACTICAL POINTS GAINED IN THE TREATMENT OF ONE THOUSAND CASES OF INSUFFICIENCIES OF THE OCULAR MUSCLES.*

BY J. WALTER PARK, M. D., late Clinical Assistant Royal London Ophthalmic Hospital; Ophthalmic Surgeon, Harrisburg Hospital; Children's Industrial Home; Home of the Friendless; and Cumberland Valley Traction Co., Harrisburg, Pa.

AS the title suggests, my paper is entirely on practical points gleaned from a rather extensive experience in the correction of Errors of Refraction. I examine the ocular muscles of every case that I refract, and when any muscular insufficiency is discovered, a record of it is made. The subject of Heterophoria or Insufficiencies of the Ocular Muscles has become one of such vast importance that I hesitated for some time, wondering whether I had sufficient experience with a large enough number of cases to justify me in expressing an intelligent opinion. In looking over my case books I find a record of about a thousand cases, of which I kept rather accurate notes, and I think the results obtained will support the views I entertain upon this subject. After all, it is following up one's cases and watching the results for several years afterwards that gives us the experience worth recording upon the records of ophthalmology. My notes of cases includes all muscular insufficiencies; those which I considered should only have general hygienic treatment; those who should have hygienic treatment as well as their errors of refraction corrected combined with the use of prisms. Of all my cases I find about 75 per cent of them insufficiencies of the external recti, 25 per cent of the internal, and but $\frac{2}{3}$ of 1 per cent of all the other ocular muscles. Insufficiencies of the external recti were most frequent in low degrees of hypermetropia and hyperopic astigmatism, averaging about 70 per cent, and about 30 per cent of the

*Read before the section of Ophthalmology at Baltimore, May 8th, 1895.

interni. Insufficiencies of the interni and externi in myopia and myopic astigmatism occurred in about 6 per cent of all the cases. I will consider the management and treatment of these cases under the following classifications: 1st, Those occurring in hyperopia and compound hyperopic astigmatism. 2d, Those occurring in myopia and compound myopic astigmatism. 3d, Those occurring from constitutional, paralytic and reflex causes. Under the first classification the majority occurred in cases ranging from a + .25 astigmatic to a + .75 either hyperopic or compound hyperopic cases, the degree of variation ranging from ½ to 3 degrees in the majority of cases. The insufficiencies occurring in refractive errors from + .75D to + 6.D generally range from 3 to 20 degrees of deviation. The majority of cases occurring in the lower refractive errors, ranging from ½ to 3 degrees, were no doubt due to spasm of the ocular muscles, and were generally relieved by correcting the error of refraction and proper out-door exercises, and in those cases in which I did use prisms, it was generally only for a few weeks at the longest when they would finally be more comfortable without them. I am now speaking of average results. I wish to impress the fact that I obtained good results in most cases of moderate degrees of insufficiencies by correcting the errors of refraction, and the advice of complete rest of the eyes for close work for some time, out-door exercises and general tonic treatment. In patients with nervous temperaments, 1-30 gr. strychnia, and the Triple Vallerianate pills, three times a day, did very well in many muscular insufficiencies varying from ½ to 3 degrees. I have seen a case of esophoria of 20 degrees reduced to 6 within two weeks, from out-door exercise alone, when no close work was done during that time. This patient is now doing continuous close work with ease for the past three months with a 3-degree prism, but has no error of refraction. I find very few muscular insufficiencies exist among patients who lead out-door lives, such as farmers, ironworkers, lumbermen, etc. Operative measures are seldom necessary in the majority of muscular insufficiencies.

A music dealer, who is myopic and reads music almost constantly, came to me nine months ago with an exophoria of 30 degrees, diplopia, and mentally very much distressed, caused by the condition of his eyes. I wanted to perform a tenotomy, but he would not allow it. I then advised complete rest from close work, and out-door exercise. I did not see him for seven months; he then came to my office feeling quite comfortable, no diplopia, and back to his usual occupation again. I think tenotomies are necessary in but few cases, and then only where diplopia exists, the insufficiency of a permanent character, suffering con-

siderable, and all other remedies fail. In those varying from 3 to 15 degrees, the majority of cases found relief in prisms (combined with their refractive errors corrected) correcting from ½ to ⅔ of their insufficiency. Some of these cases, when they are obliged to continue at their usual occupation, find relief for from six months to two years, when you generally find their muscular insufficiency has increased, and operative measures may be necessary, or they will be obliged to stop their close work. This most patients cannot afford to do, and something must be done to relieve your patient, or you lose your case. Exercising with prisms has met with but partial success in my practice. I find that the majority of patients will not follow out one's instructions at home properly, and to come regularly to the office to have it done incurs an expense which most of them will not do. The following exercise in a great many cases gives me just as good results, and will be carried out much more effectually, and with less expense to the patient. I instruct them to spend a fourth hour twice a day sitting in an erect position and fixing the eye or eyes at a point either to the extreme right or left, on a horizontal plane, and at right-angles to the body, keeping them fixed in that position for a minute or two if possible, and then repeating the experiment regularly. Tell your patient to always sit in the same position, looking at the same object, and move the eyes in a similar manner, and you will generally have the same muscular effect upon the ocular muscles, as exercise does upon any other muscles of the body. When this is done regularly for two or three weeks, you will generally have gained from five to ten degrees in convergence, or a few degrees in divergence, according to the muscle exercised. I think the tendency towards performing tenotomies for every insufficiency of a few degrees has passed by, and instead we will urge more rest and out-door exercise, and such hygienic instructions as will improve the general health. 2d, Those occurring in myopia or compound myopic astigmatism. Muscular insufficiencies in myopia, in the majority of cases, involved the internal recti, causing a divergence of from ½ to 30 degrees; the average ranging from 10 to 15 degrees. My experience in the correction of these muscular insufficiencies has not been so satisfactory with rest and out-door exercise as those occurring in hyperopic cases. I have been obliged to prescribe more prisms for continuous use in myopic insufficiencies than in hyperopic ones. The majority of cases with an outward deviation of from 10 to 15 degrees will feel comfortable with a prism correcting about half their error, for constant use. Few, in my experience, can stand even ⅔ of a full correction and wear them constantly; but in esophoria the majority of cases felt more comfortable

with a full correction. I have only performed tenotomies in myopic insufficiencies in cases of from 15 to 25 degeees of deviation, and have generally had good results with prismatic corrections in those under 15 degrees. My results from tenotomies, combined with advancements, were generally good in about 30 per cent of those cases that I was enabled to follow up, which was from six months to two years afterwards. In reference to insufficiencies of the superior, inferior and oblique muscles, my experience has been rather limited. They are so rare that, when they do occur, the correction of the error of refraction, the use of prisms and exercising of the defective muscle generally remedies the defect. I have one case now with an insufficiency of 16 degrees of the inferior rectus, upon which I wished to perform a tenotomy, but owing to the comfort he derives from a 4-degree prism base up and down, to each eye, he is not yet willing to submit to an operation. He has been wearing these prisms since September, 1894, without any change. 3d, Those occurring from constitutional, paralytic and reflex causes. I have had quite a number of insufficiencies following severe and prolonged attacks of malaria, typhoid fever, and a few following intense cerebral pains which seemed to extend to the base of the brain, also a number of paralytic cases produced by traumatic and apoplectic causes. Those of a reflex character were principally in hysterical patients, and only required treatment upon general principles. when complete recovery would always occur. Those following malaria generally vary from 2 to 8 degrees, and when prisms are temporarily worn, anti-malarial and tonic treatment given, with out-door exercise, they generally all get well. In paralytic cases, electricity and strychnia, with exercising the muscles, often assists nature considerable, especially in the young; but in those advanced in years the results are not flattering. My experience with prisms in people over 40 years of age for muscular insufficiencies has not been very extensive, but I find that the majority occurring in nervous cases require frequent changing, and generally are not very satisfactory; most of them get along better without them. A summary of my views upon insufficiencies of the ocular muscles are as follows:

1st, That following up one's cases for one or two years is necessary, and should be done in all muscular insufficiencies to tabulate results for publication. 2d, Those cases involving the recti muscles, occurring in hyperopia and compound hyperopic astigmatism of from $\frac{1}{2}$ to 15 degrees, combined with errors of refraction, will generally all do well with their refractive errors corrected, muscular exercises, out-door life, tonic treatment and the temporary use of prisms. 3d, Those occurring in myopia and compound myopic astigmatism require the use of prisms more constantly, and are not benefited quite as much by muscle exercising as those occurring in hyperopia, etc. Tenotomies, with advancements, are generally more effective than in hyperopic cases. 4th, Those occurring in constitutional, paralytic and reflex causes require plenty of rest, out-door exercising, the temporary use of prisms, electricity and general tonic treatment. 5th, Tenotomies are not necessary in most cases, and should not be done until all other remedies fail. 6th, That there are some cases or esophoria of slight degree of deviation that require nothing but rest and out-door exercise to effect a cure.

SIMPLE TESTS OF THE EYE.

By DAVID A. STRICKLER, M. D., St. Paul, Minn., Professor of Ophthalmology and Otology, University of Minnesota.

EYE strain as a factor in the production of headaches and neuroses in general is not a new proposition to the well informed general practitioner. It has been pretty generally discussed in journals and medical societies for some years past, and each one of you must have seen many remarkable results from glasses and eye treatment, in patients whom you have failed to relieve. I am sure there is a disposition on the part of physicians to cure their patients, and this disposition does not stop short of their sending them to the specialist if they have reasonable assurance that he can give the desired relief.

I am equally sure that all physicians, worthy the name, are willing to admit that the eye is a prominent factor in the production of general neuroses.

Unfortunately it is not so well known how to determine when an individual case is suffering from eye strain. It costs money to have the eyes examined by a competent oculist, and the responsibility, resting on the doctor, of putting the patient to a possibly unnecessary expense, not infrequently deprives the sufferer of relief which the oculist alone can give. Nor can we, when we consider the reputation of the general practitioner, blame him for this conservatism. It should also be borne in mind that the physician who can, at the first consultation, tell his patient that the eyes are at fault, wins his patients' confidence and future patronage. If, therefore, there are some simple tests of the eye which, with little outlay of time and money, will enable the general practitioner to select his cases for the oculist with some degree of certainty, it becomes his duty, both to himself and to his patients, to inform himself of them and to apply them.

It is my purpose to present to you such tests in language that cannot be misunderstood, and if I fail to go fully into details or fail to give all that is known along any of the lines suggested you will please remember that such is not my purpose in this paper.

First, then, what are the sources of eye strain? It may be laid down, as a general proposition, that there are but two sources of eye strain, either of which alone may produce all the discomforts any one can wish, but both of which are frequently found in the same case. They are:

1st. Ametropia, or abnormal refraction, and

2d. Heterophoria, a tending of the visual lines from parallelism.

There is such a thing as accommodative asthenopia from an irritable

or weak ciliary muscle without ametropia, but its presence is so rare, except after severe acute sickness, when common sense would suggest rest for the eye, that we may eliminate it as a factor at this time.

In normal eyes images of distant objects are focused on the retina without any action of the muscle of accommodation, (the ciliary muscle), hence the accommodation of the eye is said to be at rest when looking at distant objects.

In ametropia or abnormal refraction rays parallel before entering the eye are not focused on the retina, and as all rays coming from a distance are practically parallel, images of distant objects are formed either (a) behind the retina, as in the far-sight, or (b) in front of the retina, as in near-sight, or (c) in part only on the retina, as in astigmatism; hence, ametropia presents the following forms:

(A) Hypermetropia, far-sight, in which the eye-ball is short and the image of distant objects fall back of the retina.

(B) Myopia, short-sight, in which the eye-ball is long, and the image of distant objects falls in front of the retina.

(C) Astigmatism* (regular) in which the corneal curvature differs in its different meridians, making it impossible to bring parallel rays falling on the eye to a common focus at any spot; and,

(D) Presbyopia, old sight, a diminuition in the range of accommodation, rendering glasses necessary for near work, in normal eyes, at about forty-five (45) years of age.

Hence it will be seen that in the hypermetropic eye to properly focus the image of distant objects on the retina, the curvature of one or more of the refracting surfaces must be increased. This can be done only through action of the ciliary muscle, which increases the convexity of the lens. To see near objects this action of the ciliary muscle must be still further increased, hence in hypermetropia the ciliary muscle is never at rest during waking hours, and this constant drain on the nerve force is almost sure to tell at some time.

---

*Astigmatism may be regular or irregular. In regular astigmatism the meridians of greatest and least curvature are at right angles to each other, and the transition from the one to the other is regular.

Regular astigmatism is subdivided into:

(a) Simple hypermetropic astigmatism in which one meridian is normal and the other, at right angles to it, is hypermetropic.

(b) Simple myopic astigmatism, in which one meridian is normal, the one at right angles to it myopic.

(c) Compound hypermetropic astigmatism in which all meridians are hypermetropic, but one meridian more so than the rest.

(d) Compound myopic astigmatism in which all meridians are myopic, but one more so than the rest, and

(e) Mixed astigmatism in which one meridian is hypermetropic and the one at right angles to it is myopic.

Irregular astigmatism is not amenable to treatment and will not be considered in this paper.

Imagine, if you can, what it would be to be compelled to constantly look at objects twelve inches from the eye, and when you wanted to read or write to have to hold your paper six inches from the eye. This practically takes place in hypermetropia of three dioptres.

What the ciliary muscle undertakes to do in hypermetropia by regular contraction it undertakes to do in astigmatism by irregular contraction; by contraction of some of its fibers alone, or by rapidly changing the focus so that what should be accomplished by one action requires several, and from this fact we have more eye strain in astigmatism than in hypermetropia.

In myopia the strain on the ciliary is lessened, but a myopic eye is usually a diseased eye, and there are apt to be present other conditions needing attention.

In presbyopia the strain is present only when looking at near objects, hence the use of reading glasses for relief.

From the foregoing facts you will note that eye strain in refractive errors is almost wholly in the ciliary muscle, but the association between accommodation and convergence of the eyes is a very intimate one, and out of this association grows many of the insufficiencies of the recti muscles; insufficiencies which are relieved by properly fitted lenses which relieve the ciliary strain.

The second source of eye strain is heterophoria.

In heterophoria, with one eye fixed on an object there is a tendency for the other to wander from it, and the constant muscular effort to maintain single or binocular vision gives rise to headaches and other neuroses, as does the constant action of the ciliary muscle in ametropia.

Heterophoria is divided into:

(a) Esophoria: A tending of the visual lines inward, in which the external recti are relatively weak or insufficient.

(b) Exophoria: A tending of the visual lines outward, in which the internal recti are relatively weak, or insufficient.

(c) Hyperphoria (right or left): A tending of the right or left visual line above its fellow, in which the right or left inferior rectus is relatively weak or insufficient.

(d) Cyclophoria: A tending of the eye to revolve on its antero-posterior axis, because of insufficiency of one or the other of its oblique muscles.

Orthophoria: A tending of the visual lines in parallelism, is the term used to designate normal relationship between the external muscles of the eye.

Having before you the causes of eye strain how can you, by *simple* methods, detect them?

Every physician should have in his office a card of Snellen's test letters to test the acuteness of vision for distance. Beside it he should hang Dr. Pray's astigmatic letters or one of the many other tests for astigmatism.* He should also have Jaeger's test types for reading. Armed with these he can learn much of value to himself and to his patients.

Snellen's test types are based on the fact that a visual angle of 1′ is the average limit of distinct vision in the normal eye, and that a visual angle of 5′ is the average limit at which the normal eye can recognize form. Each square letter, viewed from the distance indicated by its number, subtends an angle of 5′, and each letter is made up of lines subtending an angle of 1′. In these cards the normal eye should see No. 20 at 20 feet, No. 15 at 15 feet, etc. Or if marked on the metric system, as they often are, No. 6 should be seen at 6 meters, No. 5 at 5 meters, etc. The cards for these tests should, if possible, be placed at a distance of 20 feet from the patient, but if your office will not give this distance, approach it as nearly as possible.

If a patient can not see to read No. 20 at 20 feet, or No. 15 at 15 feet, as the case may be, there is some defect in vision.

This defect may be due:

(a) To cloudiness of the refracting media.

(b) To diseases of the structures of eye ball or of the nerve, or

(c) To some error of refraction.

If to either the first or the second, vision will be defective for all distances, and should be tested on fine print. The cornea and the lens should be examined for opacities; the history looked into for past or present inflammations. If due to refractive error, it may be any of the forms of ametropia except presbyopia, which does not figure in distant tests.

If due to myopia in an otherwise healthy eye, the patient will read with ease the smallest print on Jaeger's card, but will hold it nearer the eye than a normal eye requires.

If due to hypermetropia the patient will not readily read fine print, and will be inclined to hold it further from the eye than normal.

If due to astigmatism, in the distant test the patient will readily see some of the letters, and miscall others in the same line. Seeing some letters *clearly*, but constantly mistaking others of equal or larger size is almost pathognomonic or astigmatism, and this is so marked in some cases that when they reach the line that ought to be seen at fifty feet they will miss one or more letters in it, and will yet be able to tell some of the letters that should be seen at 20 feet. If, on the other hand, the

*He may have a combination of letters and astigmatic lines on one card.

patient with supposed refractive error can clearly see No. 20 at 20 feet, we may know that he has either normal refraction (an emmetropic eye), hypermetropia or hypermetropic astigmatism, and that he can not have myopia or myopic astigmatism. Outside of subjective symptoms and without instruments of precision in examination, there is but one way for you to decide whether this case is one of normal or abnormal refraction, and that is by paralyzing the muscle of accommodation with some mydriatic.* If after mydriasis the patient yet sees No. 20 clearly at 20 feet, the refraction is normal. If he can not then see it the case is one of hypermetropia or hyperopic astigmatism.

The astigmatic tests are all based on the fact that astigmatism produces an indistinctness of lines running in certain directions, while in other directions the lines are clearer.

In Dr. Pray's astigmatic letters, all of which are equally dark to normal eyes, some of the letters will appear darker than the rest. If the astigmatism be of high degree the difference in shading will be very marked.

Not infrequently when the difference in shading is scarcely noted by the patient, he will yet find it difficult to look at the letters; the letters seeming to move constantly; or it may make him feel "sick at the stomach." I find these latter symptoms almost as definitely indicative of astigmatism as is the difference in shading.

Having made the distant tests, what can you learn from Jaeger's Test Types?

In Jaeger's Test Types the numbers indicate the distance in feet at which the type is clear to the normal eye. Thus No. 1 should be read easily at 12 inches, No. 2 at 24 inches, No. 3 at 36 inches, etc. Inability to read clearly at the distances indicated shows some departure from the normal. The myope will hold the print nearer than the number would indicate, but will then be able to see clearly. He can not see No. 20 at 20 feet. The hypermetrope may hold the print further from him, but not necessarily so. He may not read comfortably for any length of time, or the print blurs.

There is no rule by which you can diagnose astigmatism in reading, unless it be in a patient with relatively good distant sight who in reading brings it very close to him. I have never known this rule to fail. Only a small per cent of astigmatics so hold their print.

---

*I do not lightly recommend the use of mydriatics by the general practitioner. They should only be used by a careful and discriminating physician, else harm may result at times.

In presbyopia the patient has good distant vision, but must hold Jaeger's types further from him than the numbers indicate; he is unable to see No. 1 at all, or sees it only with difficulty.

Test for Heterophoria:

The tests for heterophoria are numerous and some of them are not especially simple. I shall speak of but one, that while not the most exact, yet is moderately accurate, and is more general in its application than any other simple means now known,—one that will meet the needs of the general practitioner in detecting the presence and character of heterophoria, both at a distance and in accommodation, including the action of the recti and the oblique muscles.

I refer to Savage's modification of the Maddox double prism, which consists of two separate prisms of 6° each, bases toward each other and put into a rim of the same size as in the usual test case, the line of the bases passing exactly through the centre of the rim. It can be ordered through any good optician and should be in the hands of every progressive general practitioner.*

To test the action of muscles when looking at distant objects, place a lighted taper or any bright object at a distance of 20 feet, or as nearly so as possible, and place the double prism before one eye, e. g., the right eye, with the line of the bases horizontal. Cover the left eye and two candles will be seen. See that both are in the same vertical line, then uncover the left eye. If orthophoria or normal muscular conditions exist there will appear a third light between the first two, equally distant from both and in the same vertical line. (See figure 4.)

FIG. 4.

Orthophoria or normal muscular relationship.

If the third light appear in any other position there is present heterophoria in one or more of its forms. The third light belongs to the eye

* The cards, test types and double prisms can be had at an outlay not to exceed two ($2) or two and a half ($2.50) dollars.

before which there is no glass, which in our supposed case is the left, and which, for convenience, we will consider the one under test.

In heterophoria the light is always displaced towards the weak muscle or muscles.

Bearing this fact in mind you can readily ascertain in any given case what muscle or combination of muscles is at fault. If the middle light, belonging to the left eye, move to the right of the other two, the internal rectus is insufficient or relatively weak. With a weak internal rectus the eye tends outward, hence it is a case of exophoria. (See fig. 5.)

FIG. 5.

Exophoria—with left eye under test. (Double prism before right eye.)
Esophoria—with right eye under test. (Double prism before left eye.)

If the middle light, belonging to the left eye, move to the left of the other two, the external rectus is insufficient or relatively weak. With a weak or insufficient external rectus the eye tends inward, hence it is a case of esophoria. (See fig. 6.)

FIG. 6.

Esophoria—with left eye under test.
Exophoria—with right eye under test.

If the middle light, belonging to the left eye, move toward the lower light or blend with it the left inferior rectus is insufficient or relatively weak. With a weak inferior rectus the eye tends upward, hence it is a case of left hyperphoria. (See fig. 7.)

FIG. 7.

Left hyperphoria—with left eye under test.
Right hyperphoria—with right eye under test.

If the light move upward, in the last experiment, it is a case of right hyperphoria.

If, under the same conditions, the middle light move downwards and to the right the inferior and the internal recti of the left eye are weak, and the left eye tends upward and outward, to which the compound term left hyper-exophoria is applied. (See fig. 8.)

FIG. 8.

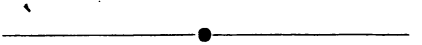
Left hyper exophoria—with left eye under test.
Right hyper-esophoria—with right eye under test.

From these examples you will see how any case may be worked out by bearing in mind that the light is always displaced toward the weak muscle or weak muscles.

The amount of heterophoria in any case, is measured by the strength of the prism or prisms required to move the light to the place it assumes in orthophoria or normal conditions, viz.: In the same vertical line and midway between the other two. Without a set of prisms you will be unable to measure the extent of heterophoria, but by bearing in mind the fact that the distance between two lights seen by looking through the bases of two prisms represents the displacement of a prism equal to the strength of the two combined, you can get some idea of the extent of heterophoria.

If, in other words, the prisms are 6^{c} each the distance between the two lights would represent a displacement of 12°. If, therefore, the middle light moved to the right half the distance between the two lights it would represent an exophoria of 6°, if one third the distance it would represent an exophoria of 4°. In this way an approximate idea of the extent of muscular troubles can be had with but one double prism. The presence of hyperphoria can often be best ascertained by placing the double prism before the eye with the line of bases vertical.

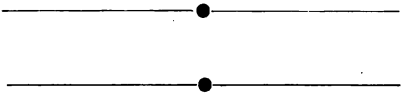
FIG. 9.



Line as seen without a glass.

The muscles may act normally when looking at a distance, and not do so when looking at near objects, hence the necessity for examining for heterophoria at close range, or as it is generally designated, in accommodation. For this purpose draw a line with a dot in the center. (See fig. 9.) This should be held at a distance of sixteen inches from the eye. Again placing the double prism before the right eye, the left being covered, you get two lines, each with a dot in its center. If the line of the bases is horizontal these dots will be in the same vertical line. (See fig. 10.)

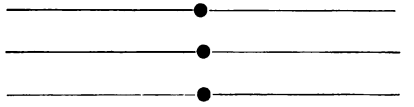
FIG. 10.



Line as seen through a double prism, one eye closed.

On removing the cover from the left eye, it orthophoria or normal conditions exist a third dotted line will appear equally distant from the other two, parallel with them, and its dot in the same vertical line. (See fig. 11.)

FIG. 11.

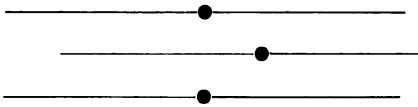


Orthophoria. Line as seen through double prism, both eyes open.

If heterophoria be present the middle line will move toward the weak muscle following the same general law as in the distant test and taking

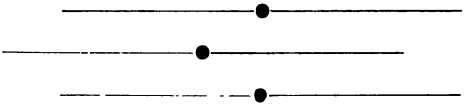
the same names for the different movements; the dots corresponding to the lights. (See figs. 12, 13 and 14.)

FIG. 12.



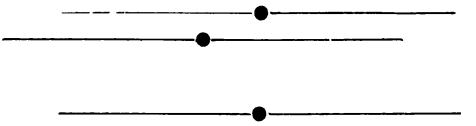
Exophoria—with left eye under test.
Esophoria—with right eye under test.

FIG. 13.



Esophoria—with left eye under test.
Exophoria—with right eye under test.

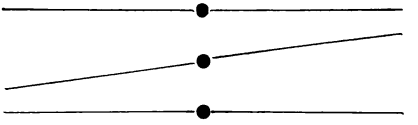
FIG. 14.



Right hyper-esophoria—with left eye under test.
Left hyper-exophoria—with right eye under test.

This latter is the only test which enables us to test the oblique muscles of the eye-ball. If insufficiency of either of them be present the middle line will not be perfectly parallel with the other two, but will dip toward one or the other end. Here again the eye before which there is no glass is the one under test. If, then, the glass be placed before the right eye the left will be the one under test. If in testing the left eye the middle line dip toward the left, the left inferior oblique is insufficient.

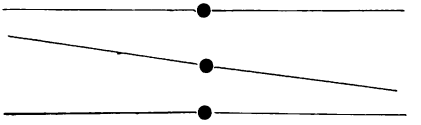
FIG. 15.



Right eye under test, insufficiency of superior oblique.
Left eye under test, insufficiency of inferior oblique.

(See fig. 15.) If it dip toward the right, the left superior oblique is insufficient. (See fig. 16.) If in testing the right eye the middle line dip to the right, the right inferior oblique is insufficient. (See fig. 16.) If to the left, the right superior oblique is insufficient. (See fig. 15.) As in the distant tests these insufficiencies may be compound.

FIG. 16.



Right eye under test, insufficiency of inferior oblique.
Left eye under test, insufficiency of superior oblique.

The amount of heterophoria that may be borne by any case without discomfort will depend very largely on the patient and the muscle or muscles involved. There are no fixed rules that can be laid down here, as there are none in refractive troubles, but it may be considered true that a small degree of heterophoria in a close student, or in a person broken in general health will annoy more than a much larger degree in a day laborer, or in a person in good health. Insufficiencies of the superior and inferior recti, or of the oblique muscles, even when of very small degree, are almost sure to give rise to marked discomfort and suffering.

Ametropia and heterophoria in any of their forms, and of almost any degree may entail marked neuroses and if found in any case should not be lost sight of as a possible factor for mischief.

In conclusion, there are a few symptoms and conditions, outside of visual defects and troubles directly referred to the eye, which are characteristic of eye strain, and the presence of which should always lead you to examine the eyes.

1st. A habit of squinting or partially closing the eyes when looking at anything, found especially in astigmatism and myopia.

2nd. Headaches from shopping, riding in street cars or railroad trains, looking at striped goods, getting into crowds, etc. Headaches in nervous women.

3rd. Headaches located in the eyes, temples, or occiput, especially what are called "sick headaches." Headaches from eye strain are rarely located in the top of the head.

Lauder Brunton estimates that 80 per cent of all headaches are due to eye strain. This may be a liberal estimate, but certainly the number is very large and the oculist has many grateful patients in the course of a year.—*Southern Journal of Homœopathy.*

Abstracts from American Edition Annals D'Oculistique.

Dr. Groz reports a case of absolute blindness caused by a vermifuge, consisting of capsules of Ext. of Male Fern and Ext. Pomegranate; each capsule containing 0.25 gm. of combined medication; in all 32 capsules were taken; patient had syncope in the evening, next day diarrhœa, and two days afterwards was blind in both eyes; mydriasis; pupils did not react to light; fundus normal, but gradually lost color and became atrophic.

* * *

Dr. Landman discusses headaches, dependent upon uncorrected errors of refraction.. He says migraine is rarely caused by errors of refraction; uninterrupted headaches are those due to this source. Pain in the eyes, extending from eye-balls to the head or surrounding the eyes after work, or situated behind the eye-balls, or attacks in the evening or painful symptoms yielding to repose,—the cause resides in the eyes. He thinks that it is refraction error and not lack of equilibrium of motor muscles of the eye that produces headache.

* * *

Dr. Clark, from researches made at London Opthalmic Hospital, concludes blepharitis to be a disease of childhood, and when seen in adults it has lasted since childhood. It is the expression of asthenopia caused by ametropia in every case; in order to relieve the condition correct the ametropia.

* * *

Drs. DeWecker and Masselon discuss the advantage to be gained in certain class of myopia from the use of convex glasses for distant vision. They state that myopes increase the sharpness of vision and can read characters at a distance which they could not distinguish with concave glasses. Inverted images are obtained, but this inconvenience can be overcome by practice. The method is to place the glass before the eye, at such a distance that its focus coincides with the punctum remotum. Practically, glasses weaker than 5 D cannot be used and it is desirable that they be 5 or 6 centimeters in diameter.

The reader is referred to the article in the February number.

* * *

Dr. Aubert says that bifocal glasses should be more commonly used than they are, as for near vision a surface of glass only one centimeter is required, the remainder to be used for the distance.

—*Clarence R. Dufour, Phar. D., M. D., Washington, D. C.*

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. JULY, 1895. NO. 4.

DO MYDRIATICS INJURE OR BENEFIT THE EYE? A REVIEW OF RESULTS IN ONE HUNDRED CONSECUTIVE CASES.

BY MAURICE F. PILGRIM, A. B., M. D., CARBONDALE, PA.
Ophthalmologist to Carbondale Emergency Hospital.

EVER since the advent of the tramp spectacle-vender and the charlatans styling themselves "Graduated Opticians" (whatever that may mean), the general public has been exercised in varying degree over the matter of cycloplegics. Before the epoch of these mongrels, there was quite enough of this superstitious dread, based, of course, upon ignorance which has ever been the prolific parent of prejudice. Since the advent, however, of these Leviathians into the troubled eddy of ophthalmology, a veritable crusade of malevolent prejudice has been inaugurated against mydriatics. This feeling has grown in some localities to such an extent as to not only make the pathway of the painstaking oculist thorny, but, at times, well nigh intolerable. It is part of the usual routine of these jeweller-opticians to advertise themselves to a confiding public, not only as benefactors by "examining eyes free," but recently they have adopted an addenda bearing this legend : "*Without Drops.*" A peripatetic "Professor" recently delivered himself to an admiring and receptive public in the following bit of chaste English: "Eyes *scientifically*" (?) examined free of charge *without using no drops whatever.* Nor do they stop there, but supplement the implication contained in their flaming advertisements with verbal dissertations upon the harmfulness of "drops" and, as a

clincher, pathetically refer to some *nameless* friend or acquaintance of theirs whose eyes had been ruined by those "abominable (?) drops." This mythical friend or acquaintance is usually without form and is void, insomuch as his habitation is never located. Being thus unlocated, all possibility of verifying these statements is cut off, which is, of course, as designed. But these "bodiless creations" born of mendacity, though bearing the stamp of absurdity, nevertheless frequently fulfill their appointed mission. People are intimidated and, as a result, still another is added to the long list of would-be Samaritans whose mission it is henceforth to declaim to friends and indifferent acquaintances about the harmfulness of "drops" and the wickedness of oculists who employ them. In other words, more than fifteen thousand men, medically trained, embracing many of the brightest minds in both this country and Europe, are held up to public scorn as being either conscienceless or ignorant, for most if not all of them employ cycloplegics in refracting.

FEB 13 1909

Nor is this prejudice limited to the *ignorant* laity. If happily it were, this paper need not be written, because that class usually rush with complete abandon into the outstretched arms of the first optical monkey-hawk that chances to be most accessible. It is their choice to do so, and they are not, as a rule, seen by an oculist until they begin to suffer as a consequence of some previously inflicted mal-practice at the hands of some designing or ignorant optical fakir. But people otherwise intelligent, not given to sensationalism, become imbued with the residual output of this prejudice against a mydriatic, and struggle as they may, their reason and confidence in their oculist is not always quite strong enough to bring them repose of mind and soul. Sometimes, in a burst of confidence that would be pathetic were it not ludicrous, they will ask us if a person is *very often made permanently blind* by the "drops," much as a person who, realizing the stern necessity of an impending and serious surgical operation, might be expected to question as to the chances of surviving it. And thus it is seen again how much easier it is to believe a lie than the truth, and how much more swift is the former than the latter when once they are together started upon a journey.

Only recently I received a letter from a former patient, a cherished friend, and a young lady of uncommon intelligence and

judgment, whose eyes had been refracted under mydriasis, and who, presumably, ought to know the absurdity of such fears, inquiring whether eyes could ever be "thoroughly examined without drops," and "whether they were dangerous if used in the eyes of children?" These queries did not originate in the mind of my friend of whose entire confidence I feel assured, but doubtless were the result of prejudice and *positive affirmations* of others (who knew less about it than she did) reacting upon her. This instance will serve to illustrate the method by which this trinity of superstition, ignorance and arrogance stalking abroad, affects people who are not otherwise disposed to be receptive to it.

Though regretfully confessed, absolute candor nevertheless compels the avowal that the medical profession is far from faultless in this regard. The family physician has too often *passively* if not affirmatively encouraged rather than combatted the popular delusion that mydriatics as employed by oculists, are injurious. If he who held the coat of the murderers while poor Stephen was being stoned to death, was justly treated as a *particeps criminis*, can our friends, the general practitioners, expect to be accounted blameless in this matter, even though they, like Pilate, wash their hands in token of their innocence, and yet who like him, yield (when they should contest) the point to the ignorant rabble? To be sure, it is not presumed that the general practitioner, amid the multiplied cares and exactions of busy professional life, shall have *personally* demonstrated that cycloplegics are immune. That mission has fallen to the lot of another branch of his profession — colleagues of his, fellow laborers in a common service to mankind. Before him is ever a long and somewhat luminous list of all-round medically trained men, many of whom occupy positions of preeminence in the profession at large and not a few of whom have shed added lustre upon the science of medicine, *who have used, are using and recommending, mydriatics.* Ophthalmologists have a just right to expect the defence of the entire profession against unjust assaults upon any member of its recognized branches. What does this hue and cry against "drops" mean,—what does it involve? It is a reflection upon the knowledge and honor of the profession. Reduced to its lowest terms, it means either that we oculists are too ignorant or non-observing to know the

effects of cycloplegics, or, if knowing them, we have not the conscience to care so long as they serve *our* purpose.

Irritated by the reiteration ever and anon that mydriatics injure the eye by "*paralyzing the accommodation*" (those words are a sweet morsel in the mouths of some of the optical hucksters), and not because of the slightest personal doubt as to their absolute harmlessness *in the hands of competent medical men*, the writer determined some time ago to make a systematic investigation, carefully testing the accomodation *before* and *after* mydriasis. This was done in 100 cases — not *selected* cases, let it be understood, but *every* case coming to the consultation room that it was found necessary, after proper objective test, to refract. The results of that examination, involving an immense amount of time and labor in testing, re-testing and recording, it is now my purpose to submit. If it shall serve to strengthen the faith of the younger and less experienced refractionist in the truth of what he must have been taught, or encourage him to go forward in the *uncompromizing* performance of his duty, the writer will have no occasion to regret the labor which this investigation has entailed. Nor is he so presumptuous as to imagine that these observations and this recapitulation — for they do not rise to the dignity of a "study" — can *materially* benefit, if, indeed, at all, the refractionist of riper experience. But in this fretful tide of optical jingoism it sometimes requires a good deal of moral courage to face unmoved, a frowning and uninformed public. To the dissemination of knowledge pertaining to the science of refraction, "The Refractionist" was originally dedicated and has been devoted. Its splendid mission will not be entirely fulfilled if it does not also labor to preserve intact against the assaults of ignorance and mendacity, those methods which, bearing the authoritative stamp of approval, have come to us honored alike by the masters and our own individual experiences.

The 100 cases upon which the investigation was based, ranged in age from 7 to 47. They were taken in regular order as they entered the consulting room. Only those disclosing an error of refraction at the preliminary objective test, were recorded. All cases presenting inflammatory affections of the cornea, iris, ciliary body and the deeper structures of the eye, were excluded from the record. These 100 cases embrace only

those who came because of bad refraction *per se*, its external expression or resultant reflex disturbances. Each case was seen at least twice, the larger number three or more times exclusive of the day upon which the mydriatic was instilled. Each visit was usually a week apart. In no instance was the result of the second testing recorded until the eyes had fully regained their accommodative power.

As to sex: 67 were females; 33 were males.
As to age: 26 were between 35 and 47.
19 " " 20 and 35
48 " " 12 and 20.
7 " " 12 and 7.

In only 14 % of these cases was defective vision complained of. In other words, consultation was not sought on account of *conscious* visual trouble, but because it was suspected that the discomfort complained of *might* be of ocular origin. Therefore, 86 % may be said to have been due to trouble which was in the predetermined opinion of the patients, essentially if not wholly dissociated with defective refraction.

In 44 %, asthenopia was *very pronounced.* This class was composed largely of females. As to age, they were about equally pro rated between the 35–47 and 20–35 classes.

About 18 % were asthenopic, more or less.

48 % bore external evidence of eye-strain, such as conjunctivitis, blepharitis, cysts, lachrymal troubles, etc. Quite a large number of this percentage are also classified in the "Asthenopic group."

While headache was more or less common to the majority of the 100 cases, it was noticeably most marked among the sufferers from asthenopia.

METHODS OF REFRACTION.

In each case the preliminary step consisted in measuring the patient's range of accommodation and vision for distance and recording the same. This was done subjectively and, of course, without a mydriatic.

Sixty-eight read on test card, 20-20ths. Of this number, all but five refused to accept the very weakest lens (0.12 D).

The second step was examination with the ophthalmoscope, followed immediately by retinoscopy, both being carefully conducted in the dark room. These objective examinations disclos-

ing an error of refraction, a mydriatic was next instilled, usually two drops of a solution composed of

Sulphate of Atropia	Gr. 1-15th.
Hydrobromate of Homatropin } Hydrochlorate of Cocaine } .	aa. Grs. x.
Aqua Distil	Ounce i.

were instilled into each eye, at half-hour intervals, for from two to four hours, or until complete mydriasis was attained. It was rarely necessary to repeat the instillations more than five times. In four cases, however, seven half-hour instillations failed to suspend ciliary activity, compelling a resort to atropin (4 grains to the ounce) which had to be repeated several times.

Returning now to the records of the sixty-eight cases, who *before* mydriasis read 20-20ths, sixty-three of whom rejected all lenses, *after* mydriasis it was found that all but two of them by the same subjective test first employed, accepted corrections not below 0.50 D. and that, too, after deducting 0.37 D. from the total refraction, which is the writer's usual practice where a cycloplegic is used. In the case of the two exceptions noted, one saw more clearly with 0.37 D. cy. axis 90°, and the other *saw as well* with + 0.50 D. S. ⌒ + 0.25 cy. ax. 65°.

It is to be here noted that *relying exclusively upon the subjective method* as does the refracting jeweller, sixty-three of these patients would have gone their several ways without correcting lenses inasmuch as unquieted ciliary activity caused a rejection, at the first primary test, of lenses as low as 0.12 D. To have withheld them would have amounted to little less than a crime as was proven by the beneficial after results.

Experienced ophthalmologists accustomed to the use of the ophthalmoscope for the purpose of estimating refraction, know how difficult it is to make satisfactory estimations when the patient accommodates. In the larger proportion, if not the majority, of cases, nothing will suffice as a preventive against the patient accommodating except a cycloplegic carried to complete mydriasis. Nor is that the only difficulty encountered in attempting to estimate refraction by ophthalmoscopy. We have learned from the studies of several men eminent in ophthalmology, prominent among whom is Dr. Edward Jackson, of Philadelphia, that the existence of an *extra*-visual zone will, through a small or contracted pupil, present refractive conditions different from those of the true visual zone. This constitutes a

very great obstacle to accuracy with the direct method of ophthalmoscopy, and this, too, when the accommodation of both observer and patient is *fully* relaxed, a condition which experience admonishes us is very rarely attained. It is to be remembered also that it is with the visual zone of the dioptric media that the oculist is chiefly concerned and which it is the most important to estimate.

It will doubtless be noted that the *affirmative* advantages of cycloplegics in refraction work have been presented before putting in evidence anything in defence of their employment. This is done designedly because it is submitted that for the purpose of this consideration, the results that followed in the one hundred cases referred to, constitute an absolute refutation of the prevalent and silly notion that mydriatics, though useful and, possibly, somewhat necessary in the oculist's hands, are, nevertheless, injurious to the eyes. If they are a tithe as harmful as the insane clatter of these optical jugglers would indicate, is it not fair to suppose that their viciousness would have been indicated, in some manner, at least, in the examination of one hundred cases, each of them watched and studied with special reference to that point?

In order to curtail the length of this paper, already too great, only *general* results will be grouped and stated.

RESULTS AFTER RECOVERY FROM MYDRIASIS.

Time usually one week.

Of thirty-four cases in which the range of accommodation was at the first test very defective, *after full mydriasis*, lasting usually from twenty-four to sixty-five hours, nineteen were able to read Jaeger No. 1 two inches nearer and four inches further from the eyes than at preliminary test, which was made, as we have seen, before the instillation of the "drops." Of the remaining fifteen, nine were found to have each gained between one and two inches near, and from two and a half to three inches in far range, over the records made at the first test. The other six showed a slight gain, but less than the fifteen just mentioned. It is worth noticing that these cases (the thirty-four) were among the worst sufferers from asthenopia, and also had the highest range of refraction errors. Not only did the accommodation not lag behind, but, on the contrary, its range was increased; furthermore, in *every* case, *without even one exception*, where asthenopia had

been one of the grievances complained of *before* mydriasis, after the re-establishment of accommodative function, the patients remarked that their eyes had experienced a great sense of relief and felt rested. Some even declared that they had not been so comfortable in months as during and immediately succeeding mydriasis. As one of the primary requirements in reparative processes is that the enervated or disabled organ shall be put in a physiological state of rest, it is not surprising that mere suspension of ciliary activity brought to the tired eye the opportunity for repose and a resultant comfort hitherto unexperienced.

Returning now to the remaining sixty-six cases, the records before mydriasis showed in twenty-seven of them a range of accommodation slightly below normal. The other thirty-nine had normal ranges. *After* mydriasis, twenty-four showed accommodative gains of less than one inch; thirty-nine showed no change at all from first test. Three cases only in the one hundred showed diminution of accommodative range, the highest being three, and the lowest one and one-half inches. Two of these patients, unmindful of instructions, had commenced using their eyes before ciliary activity had become fully re-established; while the third—a draughtsman with a high grade of oblique astigmatism—had spent half of the entire night immediately preceding the day of his second test, at work on his drawings, with very bad illumination. No difficulty is experienced, therefore, in accounting for the diminished visual ranges in these three cases, and they are significant of but one thing, *i. e.*, that a small percentage of people, usually sensible, occasionally have perverse and silly moods when they permit themselves to do some very foolish things.

Though not pertaining to the main purpose of this paper, it is worth while to observe, incidentally, that a rise of tension to an appreciable degree, was not observed in any of the cases under consideration. It is a justifiable assumption, therefore. that these patients were not "needlessly subjected (using the phrase of a recent writer) to the perils of a glaucomatous attack." The writer has never been so unfortunate as to verify in his experience the dangers of mydriatics as pointed out by this writer. He has repeatedly used, even in advanced cases of serous iritis or descemetitis, atropin freely with only gratifying results, although not unmindful that some authorities discourage its use

in toto under such circumstances, and others advise its employment, if at all, *cautiously*. The writer is well prepared to agree with Dr. Noyes, who says,* in speaking of the treatment of some forms of iritis, that the trouble is that atropin is not used often enough or in sufficient strength in many instances to accomplish the good of which it is capable. Reviewing an experience of several years, during which mydriatics were freely used, and as often as occasion seemed to demand, whatever regret now remains is *when they were employed too sparingly or with too great caution.* Their energetic exhibition has invariably been followed by the most satisfactory results. It is needless to remark to medical men that atropin was never instilled until a complete exploration of the fundus and disc with the ophthalmoscope had failed to disclose contraindications to its employment. Assurance obtained in this manner is much more satisfactory, present and future, than reliance upon any or all other methods that are supposed to furnish to the contraindications to the use of this valuable drug or its congeners.

The results of mydriasis in the 100 cases under consideration, are summarized thus:

BEFORE MYDRIASIS.

Defective range of accommodation, . .	61 %
Normal " " " . .	39 "

AFTER MYDRIASIS.

Gain in range of accommodation, . . .	58 %
Normal range " . . .	39 "
Diminished range† " . . .	3 "

Touching the main question whether cycloplegics unfavorably affect the accommodation, comment, in the presence of the foregoing figures, would be superfluous. The figures speak definitely and are a more eloquent protest against the mischievous notion that "drops injure the eye" than the opinions or assertions of any man or set of men. Moreover, they may contribute in no immaterial degree to ocular therapeutics and possibly become valuable in the treatment of accommodative embarrassments and complications which are at times so troublesome to the oculist.

* Diseases of the Eye. Noyes.

† Due to the patients' disregard of instructions during re-establishment of accommodation.

This paper cannot perhaps be more appropriately closed than by a quotation from language once used in the writer's presence by a gentleman of deserved renown and to whom ophthalmology owes very much,—the late Dr. Agnew, of New York. Speaking of the then somewhat prevalent tendency among a class of timid medical men to refract without "drops," Dr. Agnew said: "Were the dispensation of justice committed to my hands, I "would lodge within the walls of the penitentiary where he "could not do further harm, any person guilty of fitting glasses "to the eyes of a fellow human being yet under 45 years *without* "*having first completely suspended the accommodation by use of* "*the proper drug.*"*

Selections.

An Optical Training.

(With parenthetical comments by the Editor of The Refractionist.)

It is becoming more evident every day, that it is only a question of time when the various Provinces in the Dominion of Canada (and the States too) will be compelled to pass laws allowing only those to fit spectacles and eyeglasses who are properly qualified to do so. The public are only now beginning to be alive to the fact that the fitting of spectacles is an important operation, requiring for its proper performance a person thoroughly versed in the science of optics. They are also beginning to learn that one of the most dangerous things possible is to allow spectacles to be fitted by incompetent persons, (applause) and once they become fully alive to the importance of these facts, an agitation will certainly spring up which will soon crystalize their ideas on this subject into law, (whereby we may be enabled to have the refracting opticians pay the penalty for their crimes.)

We are aware that there are many jewelers selling spectacles and optical goods who entertain the opinion that although they have not taken a course at any optical institute, they are in every way fully qualified to pursue this calling as successfully, and as much for the public benefit, as those who have done so. With all due deference to the opinion of these gentlemen, we

*Dr. Agnew's reference was to Atropin, Homatropin not having at that time yet come into general use.

are sorry to say that we cannot see eye to eye with them on this point, and if they live long enough, they will find that the public, to whom they render such service, will not do so either, as soon as they become fully seized of the actual facts.

We are perfectly satisfied to leave the merits of this question to any jeweler who has *thoroughly* qualified himself for this profession by taking an optical course, (two weeks) and to leave it to him, whether in the light (darkness would be the better word) of his present knowledge he should have been allowed to experiment upon the eyes of the public in the haphazard fashion he formerly did before he received a special optical training. We know from conversation with several prominent jewelers who have taken such a course, how changed their views have become upon this subject, and we are satisfied that just as soon as the optical graduates get sufficiently numerous, an agitation for such a law as indicated above will quickly be set on foot. (*We* know from practical experience that when these celebrated Doctors of Refraction, Refracting Opticians, Masters of Optics, etc., have gone *considerably* further and extended their two weeks' course to a four years' medical course, to which should be added two years study of the eye, they will realize how much gall it takes *to experiment upon the eyes of the public in the haphazard fashion they formerly did.*)

In view of such a probability we would advise every jeweler dealing in spectacles and optical goods to prepare himself for the thorough change which is bound to follow the enlightenment of public opinion upon this subject. The fitting of spectacles and eye-glasses, instead of being a haphazard business, is really a branch of the medical profession, (why don't you fakes let it alone then, and leave it *to* the medical profession?) and no unimportant one at that. We feel certain that in time it will become elevated to its proper sphere, just as the dental profession has, and not only will those who practice it have to be licensed to do so, but they will be compelled to pass an examination and receive an official degree of some kind, which will serve to distinguish their calling. Unless the trade can be elevated (four years in college, four in medicine, two in post-graduate work) up to this status, (of Doctor of Medicine—M. D.) they will be forced to take a lower relative position than they now occupy, and simply become the dispensers of the medical

doctor's optical prescription, in exactly the same way as the druggist at present fills his prescription for physic. The time for the jewelry and optical trade to establish their right to the higher status is now and in the near future, and if they are only alive to their opportunities they can very soon practically command this important and lucrative branch of the medical profession. (Don't be so modest. Take the whole profession. You can do an ovariotomy as well as you can refract.) The goal is an honorable one, (applause) and as it would do much to raise the jewelry trade above the rank of the ordinary tradesman, (loud applause) and materially help them in the conduct of their regular business, as many of them should take advantage of it as possible. In these days of keen competition from fancy goods and departmental stores, the jeweler should do everything that lies in his power to impress (to deceive is a better term) upon the public the fact that while cheap goods may be purchased in such places, high class goods can only be purchased through the educated jeweler who thoroughly understands his business. Anything, therefore, which has a tendency to lift the jeweler and his business above the departmental store style of doing business, should be encouraged, and it is for this reason that we have been so insistent on our readers who handle optical goods to qualify themselves so that they can take full advantage of their opportunities. (There are at least three classes of physicians who aid in bringing about a condition of affairs as indicated above. 1st, The worse than fake, who establishes so-called optical schools and gives courses to non-medical men. 2nd, The prescription oculist who patronizes a refracting optician. 3rd, The practitioner who has not learned better than to advise those needing glasses to visit departmental stores, jewelers or graduate opticians. For the good of the cause it is hoped that the reader is above either of these three classes. If not, brother, you need to be reformed "and while the lamp holds out to burn the *vilest* sinner may return.")—*The Trader.*

Note on Smoked Glasses.

Eyestrain as a potent factor in the causation of headaches and general nervous phenomena is admitted by the most conservative. How necessary then, in these cases, to eliminate this element whenever found. A frequent cause of eyestrain, that is often overlooked, is the cheap smoked glass.

The glass I refer to is an imitation of the French coquilles. When properly made, there is no objection to coquilles, but they are expensive and hard to find. The cheap American imitation has curved surfaces, the convex being out and the concave surface worn next to the eye. Usually the concave surface exceeds the convex surface in curvature and the result is a nearsighted lens. This can readily be proved by holding the glass in front of the eye and moving it back and forth. If the object, as seen through the glass, seems to retreat ever so slightly when the lens is moved away from the eye of the observer, the lens is a nearsighted glass. Often it will be found that if the glass is held parallel with the eye and rotated slightly, all objects seen through the glass will be distorted. This shows imperfections in the curvature, which would tend to irritate the eyes whenever worn.

Any bright light causes pain, because it produces extreme contraction of the pupil, and this strain on the ciliary muscle tires the eyes in a short time. A smoked or tinted glass shuts out some of the rays of light and allows the pupil to dilate, producing at once a sense of comfort.

The majority of people wearing these smoked glasses are farsighted. Wearing these curved American nearsighted glasses brings the accommodation into play, creating all sorts of reflex nervous disturbances, and may even permanently impair the vision.

The smoked or tinted glass with plane surfaces are cheap and do no harm whatever to the eyes. This kind should always be preferred.—RICHARD H. SATTERLEE, M. D., in *Buffalo Med. Journal.*

Imperfect Eyes Among School Children: How Caused.

1. By using the eyes too constantly at a short distance, as in reading and writing. Indian boys in the woods never become near-sighted, but thousands of our school children do every year. At birth the eyes are adapted to be used at all distances, but by using them exclusively at short distances they soon become of value only for seeing objects close at hand.

2. By using the eyes too constantly and too long at a time. The eye is a very delicate organ; its parts become weary like the rest of the body. If overworked, serious results follow. The eyes should never be used when they ache, pain or smart, or when vision is weak or blurred.

3. By using them when weak from sickness. After the diseases of childhood, as measles, scarlet fever, whooping cough, etc., the eyes are often left weak, and may be many months in recovering their full strength. If at such times they are much used in reading or studying, they are very liable to receive permanent injury. To this cause may be laid a large proportion of the defective eyes in our schools.

4. By using the eyes in insufficient light. Very many of our school-rooms are poorly lighted. Children cannot see in them on dark days. Rooms are made still darker by the use of curtains and blinds, which are often partly closed or drawn, and are placed at the top instead of at the bottom of windows. Windows are very often too small. They are often filled with flowers. If children study in the evening, it is too often with a poor light.

5. The print of school books is too often fine and indistinct.

6. Especially in this the case with regard to maps, which are in the highest degree confusing and distressing to the vision.

7. Polished black-boards are both distressing and trying to the eyes, the writing on them not being visible except from certain points of view.

8. The chalk-dust caused by the use of the black-board and of a dry cloth or eraser is very irritating to the eye.

In what why can the State prevent these deplorable results and preserve the normal vision of its people?

First, by taking pains that school directors shall be persons of intelligence and education, and that positions on school boards

shall not be the rewards of political tricksters and ward workers.

Secondly, by issuing instructions to school directors as to the construction and maintenance of school edifices, especially, with regard to the proper introduction of light.

Thirdly, by making positions on school boards open to women, who, as a rule, are more keenly alive than men to the necessity for guarding the health of children in every respect.

Fourthly, by compelling all applicants for positions as teachers to pass an examination on the hygiene of the school-room, and especially on the hygiene of the eye.

Fifthly, by printing and distributing, not only among these functionaries, but also among parents and the public generally, brief circulars of information and instruction on these subjects.

Sixthly, by obtaining the introduction into public prints and the daily press of articles of the same nature.

Seventhly, by diminishing the hours of study, especially in the primary grades, and diminishing the amount of reading and writing now required during study hours, by encouraging the use of object teaching and illustrated lectures.

Eighthly, by stamping out all eruptive contagious diseases, which are known to have inflammation and ulceration of the eyes, or asthenopia as their sequels.

Enough has, I trust, been said to demonstrate that the State has very definite and positive duties, not only for the prevention of the increase of this large class of defectives, but for the absolute abolition of one of its divisions, and the notable diminution of all.—DR. BENJ. LEE in *Virginia Medical Journal.*

BOOK NOTICES.

SKIASCOPY, AND ITS PRACTICAL APPLICATION TO THE STUDY OF REFRACTION. By Edward Jackson, A. M., M. D., Professor of Diseases of the Eye in the Philadelphia Polyclinic, Surgeon to Wills' Eye Hospital, etc , etc. 112 pages with 26 illustrations, mostly original.

TABLE OF CONTENTS.

Chapter I.—History, Name, Difficulties and How to Study the Test.
Chapter II.—General Optical Principles, Reversal, Real and Apparent Movement of Light, Rapidity of Movement, Form and Brilliancy of Light Area. The Point of Reversal.
Chapter III.—Conditions of Accuracy. Source of Light. Focusing on Retina. Positions of Accuracy. Irregularities in Media or Surfaces.
Chapter IV.—Regular Astigmatism. Points of Reversal, Band-like Appearance. Changes with Distance. Direction of Band and Movements.
Chapter V.—Aberration and Irregular Astigmatism, The Visual Zone. Symmetrical Aberration, Positive and Negative. Irregular Astigmatism. Conical Cornea. The Scissors Movement.
Chapter VI.—Practical Application with Plane Mirror. Position and Arrangement of Light. H., E., M Regular Astigmatism. Aberration and Irregular Astigmatism. Measurement of Accommodation.
Chapter VII.—Practical Application with Concave Mirror. Position and Arrangement of Light. H., E., M. Regular Astigmatism. Aberration and Irregular Astigmatism. Measurement of Accommodation.
Chapter VIII.—General Considerations. Apparatus. Mydriatics. Relative Advantages of Plane and Concave Mirrors.

The Edwards & Docker Co., 518 Minor street, Philadelphia, Pa. Price, $1.00. 1895.

Skiascopy, the Shadow-Test, is recognized by all who have mastered it as the most important objective method of measuring refraction. This book gives the clearest, most complete, and most practical account of it yet published.

Dr. Jackson is master of his subject, and we feel that no better review of the work at length can be given than to publish the Contents in full and urge every physician interested in Refraction to procure a copy at once.

SEXUAL NEURASTHENIA (Nervous Exhaustion). Its Hygiene, Causes, Symptoms and treatment with a chapter on Diet for the Nervous, by Geo. M. Beard, A. M., M. D. Edited with notes and additions by A. D. Rockwell, A. M., M. D. Fourth Edition—with Formulas. Published by E. B. Treat, 5 Cooper Union, N. Y. Price, $2.75. 1895.

Disturbances of the sexual function are the cause of much of the misery which the physician is called upon to combat, in fact a larger part than is generally accepted. Having been associated with Dr. Beard so long, Dr. Rockwell is prepared to bring out the papers of his late associate and make such additions as will bring this subject up to date.

SURGICAL NURSING. By Bertha M. Voswonkel, graduate of Episcopal Hospital, Philadelphia, with 111 illustrations. P. Blakeston, Son & Co., Philadelphia, Pa. Price, $1.00. 1895.

A practical outline of Nursing, with chapters on Massage and Invalid Cookery.

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. AUGUST, 1895. NO. 5.

HOMATROPINE HYDROBROMATE.

BY CLARENCE R. DUFOUR, PHAR. D., M. D., WASHINGTON, D. C.

MUCH has been said for and against this drug, as a Mydriatic for paralyzing the accommodation, in determining refraction errors. Though not so thoroughly reliable as the Sulph. of Atropine, yet in my experience it has grown to be reliable, so much so that I seldom use Atropine in my refraction work.

This city has a population of about 260,000, and is dependent upon the government clerks for most of its business; a class of bread-winners whose eyes are taxed to their utmost in doing their work. It is from among this class that a majority of our refraction errors are found. These patients, as a rule, are not willing to undergo any treatment that will keep them from using their eyes for any length of time, so for that reason I began using a solution of Hydrobromate of Homatropine, one grain to one drachm of water, instilling into each eye one to two drops every 15 minutes for two hours. This I usually have the patient do at home. At the end of the two hours the accommodation is sufficiently paralyzed to determine the exact refraction error. The effect is over in about 24 to 30 hours, so that the patient is not away from work more than two days, and frequently only one. Sometimes this solution produces some congestion and pain, but not enough to cause any annoyance. In looking over my case book I find many whose vision before Homatropine was 15-20; after, 15-200,—showing conclusively that the accommodation was fully put at rest. On several occasions I have used a solution of Sulph. of Atropine in the eyes already under the effect of the solution of Homatropine, and my findings have been the same. This applies to Hyperopia and Hyperopic Astigmatism, as of course we seldom, if ever, use a mydriatic in myopia.

1016 I Street.

ANISOMETROPIA.

By C. W. HAWLEY, M. D., Chicago, Ill.

THE two cases here recorded illustrate a combination of eyes in one individual that is very striking in several points, as well as convenient, and an apparent improvement on the normal condition.

Mr. B., merchant, 55 years old, called at my office in April, saying that his eyes were beginning to trouble him and that he needed glasses, though up to this time he had had no trouble working with his eyes at close range, and consequently had never worn glasses.

Before proceeding to examine the eyes I remarked that he must be near-sighted, which he denied; then I concluded he must be one of the very rare individuals whose presbyopia is very much delayed, but the examination proved this to be a mistake on my part.

On covering the left eye he could read the smallest letters with perfect ease, but on covering the right eye he could only read the largest letters on my chart. Then began to appear the cause of his extended presbyopia, and my first statement that he was near sighted was half correct, as he was near-sighted in his left eye.

He was very much astonished when he discovered that he could not see at a distance with the left eye. He had always supposed both eyes were alike, and had prided himself on his good vision. Yet another surprise was in store for him. I covered up the left eye again and asked him to read, which he discovered was impossible; then, covering the right eye, he found he could read fairly well with the left, but as he had reached the limit of his nearsightedness, he required a weak convex lense to read well, and the usual convex lense for the right eye. He was very much puzzled when told that he had been for ten years using the right eye only for distant vision, and the left only for reading. It seems strange that one can go for so many years with one eye so poor in visual acuity and not discover it.

Yet I saw in a clinic in London, a man of about 30 years of age, who could see absolutely nothing with his right eye and had never discovered it until he went out to learn to shoot, when, on raising the gun to his shoulder, closing the left eye to aim, he found he could see nothing. He dropped his gun in the field and came to London, just he was, in his hunting suit, to find out the cause of it, and could hardly believe it when told he had always been blind in that eye.

The second case is similar to the first, but opposite in belief. Instead of thinking he had a good left eye, he supposed he was blind in that

eye. This man was 58 years old and had never worn glasses, but of late had been having some trouble in working at close range.

On testing his right eye for distant vision I found it to be nearly normal, but when I turned to the left eye, he remarked, "that is my blind eye, my younger brother pushed a fork into it when I was six years old." He could only distinguish forms at 20 feet.

On covering up the left eye and giving him a paper to read he became quite alarmed when he found he could not do so, and naturally wanted to know what I had done to it; but on covering up the right, he was still more astonished to find that he could read with that eye, and wanted to know "what the fork had to do with it, any way."

Both these patients had been using one eye to read with, and when they wished to see at a distance unconsciously changed to the other. That had been the condition in both for nearly ten years. It seems very strange that an individual could go from childhood to nearly sixty with practically blind eyes for distant vision, and not discover it. How they went all this time without covering up the right eye is singular. The first had sufficient myopia to allow him to go to 55 years before he felt the need of glasses for reading; and the second would never need them were he not annoyed by considerable astigmatism.

Apparently these patients were very fortunate, for it seems as though one normal eye and one myopic eye was an improvement on the natural condition of two normal or hypermetropic eyes.

CHICAGO, ILL., 70 State Street.

LATENT ASTIGMATISM.*

FIRST: Latest astigmatism is a frequent and important cause of asthenopia. Second: Latent astigmatism may in many cases be made manifest without a cycloplegic and without interfering with the patient's business, by giving lenses which correct the manifest error, which may be worn a day or two, when an additional amount of astigmatism will be manifest which may be corrected in the same way, and so on till all the latent trouble is unmasked. Third: This may be done without discomfort to the patient, and is therefore advantageous with the skeptical, the irritable and the nervous. Fourth: Recent text-books do not give this subject the attention its importance deserves. Fifth: Astigmatism may be latent whether the axis of greatest curvature is vertical, horizontal or diagonal. Sixth: Cases are given illustrating the foregoing points.

* Summary of a paper read by Horace M. Starkey, M. D., of Chicago, at Baltimore, May, 1895

Selections.

Hospitalism.* The dispensary disease, or hospitalism, is a contagious epidemic, ingravescent neurosis of civilization, limited (it is to be hoped) as regards time, to the present *fin de siecle*, and as regards geographic distribution, to urban populations; it attacks three considerable classes, the professional philanthropist, the commercial physician, and the social sponger, and, so far as medicine is concerned, is characterized by a maniacal propensity to professional suicide, and to the spread of the disease by the inoculation of the will with the germs of the affection.

ETIOLOGY.

In brief, there are two chief etiologic factors. The first consists in the morbid desire of the lazy charity-monger to perform his duties vicariously; the second springs from the ambition of certain physicians to "get on regardless." From the interactions and mutual complementings of these two cachexiæ arises the distinct type of disease called Hospitalism. These two agencies may need an added word of explanation. The first, the habit of the professional philanthropist, united to the universal desire to satisfy conscience with vicarious charity, is a wide-spread evidence of religious and ethical anemia, resulting in multiform sociologic denutrition and malfunction. The unregenerate layman, the civilized savage of modern times, is subject to a strange hypnotic delusion that the universal law of the biologic world antedating civilization is an egregious error. This law up to now has proceeded on the assumption that health and vitality are the conditions of permitted life, and that this health and vitality are based essentially upon pay or equivalence of service, upon personal self-dependence, desire, and effort. The modern philanthropist jauntily sets aside the wisdom of the ages, the necessities of evolution, and all that, and says he has a much better idea of how to conduct the universe than has God. Acting upon this antithetic science he says the conditions of social health are the encouragement of personal dependence and the increase of pauperism. His remarkable therapeutic theory is that to cure a disease we must administer a remedy that in health would produce exactly the symptoms of

*Abstracts from a paper read before the American Academy of Medicine, at Baltimore, May 4, 1895, by George M. Gould, A. M., M. D., of Philadelphia. (June Bulletin.)

the disease. He therefore seeks to cure pauperism and dependence by increasing the number of paupers and dependants. There is nothing so delightful to weak souls as the unctious self-flattery of benevolence, and there are few things more satisfying than to rid oneself of a nagging duty. We thus have two classes of citizens: The tremendously large class who pay others to perform their personal duties, and the very small class of those who hire themselves out as agents of the first class. Charity and the personal relation to the poor and sick are thus deftly avoided by this copartnership, and almsgiving and institutionalism deceptively act as vicegerents of the genuine officers. This is the first factor of the dispensary disease.

The second factor is confined to the medical profession itself. Like most other people, certain doctors desire to "get on regardless." The vicarious and professional philanthropist offers him the means in the shape of institutions for the treatment of all other diseases except the hospitalic variety. (Perhaps in the lapse of time and with the growth of virtue we shall have a special hospital in every large city where may be treated those in the acute and violent stages of the terrible disease, Epidemic Hospitalism.) If the enterprising doctor can get himself appointed "Professor," or "visiting physician" to one of the numerous institutions supplied by the vicarious philanthropist, he will at once become better known; he will be furnished abundant "clinical material;" he will get ahead of his less fortunate brothers; and he will assuredly "get on regardless." Lachrymose sentimentalism and philanthropic vanity are appealed to, endowments follow, wills and codicils to wills are made, and lo! there arise the lofty walls, the spacious wards, the waiting and operating rooms, the crowded out-patient departments, the boards of wealthy trustees, and the not-to-be-forgotten medical staff itself.

* * * * * * *

SYMPTOMALOLOGY.

The disease afflicts three distinct classes of society, and has a somewhat different symptom-complex in each class.

1. The first, the endowing class, many of them placed by death beyond the reach of criticism, is composed of those that mistakenly preferred to patch up effects rather than altogether to prevent them, and who left their money without proper stipulation of the conditions under which their trust should be administered. Theirs is a mournful error. There are so many ways, especially in medicine, of preventing disease, of killing the causes of diseases, instead of curing the individualized results, that it is shameful that they did not add wisdom to pity, and to kind-

ness, intellect. If we could but show the benevolent how much greater and more speedily reached would be the effect of their charity if applied to the encouragement of preventive medicine instead of to curative medicine. One well-equipped and endowed laboratory of hygiene, of bacteriology, or of sanitary science would do more for humanity than a dozen hospitals. To prevent diphtheria is a million times better than to everlastingly keep treating children ill with diphtheria.

* * * * * * *

2. The second class, the lay-public, likewise suffers from the disease, although it thinks itself very cunning and lucky in having the disease. There are more diseases than hysteria that people love to suffer with, and the dispensary-affection is an example. There is no evil that is more ruinous than the awful one of communism. When a man gets that poison in his blood he will be a curse to the world until he is well-hanged, thoroughly dead, and everlastingly buried. There is no curse so fatal as the curse of desiring to get something for nothing. It is the half-hidden rock upon which the very ship of state, democracy itself, is running headlong. Nothing is serving so subtly and so powerfully to prevent physical and social health, and to kept the world in the thraldom of disease as medical beggary and medical communism. When a man buys medical service for nothing he pays a high price for it. He cultivates the habit of lazy reliance on medical aid, and grows careless of hygiene. The people think they are fortunate in being treated for nothing, but instead of curing, the "treatment" really fastens the disease perpetually upon the very heart of the body politic. The profession is bound to the treadmill of curing individual cases, and the effects of disease, instead of shutting off the causes of disease. The profession is so hardly pressed and so poorly paid that its members have no time to prevent disease. One of the great curses of medicine is the commercial medical college with the resultant superabundance of doctors. The hospital and dispensary disease is encouraged by (nay, is one of the direct rusults of) the commercial medical college, and the vicious circle is completed by the mere reversal of the process. The rivalries and ambitions and "politics" of competitive medical charities, displayed every day stark naked to the public, at once arouse and disgust the world, and keep low that standard of professional dignity and honor, so that the profession cannot demand and command health. Hygiene and preventive medicine could at once halve the death rate if we had the respect of the community, if we but spoke clearly and could carry to realization the known laws of life saving.

* * * * * * *

3. But the physician is interested in his profession, and the influence of hospitalism upon our guild is becoming pernicious in the extreme. Take the simple fact of hospital manners. I well understand that neither the possession of the doctorate degree, nor the possession of the knowledge and skill it should certify, can make a man a gentleman. But there is no doubt that the instant influence of the necessity of treating crowds of mingled deserving poor and of indistinguishable spongers acts disastrously upon the physician's disposition and manners. The very work wherein gentle kindness is as the sunshine's benediction over the gracious harvest-fields of benevolence, is transformed into bitterness and harshness. What is more disgusting than arrogance and dictatorialness in a physician? What is more common in hospitals and dispensaries? A dog judges of his master's mood by the manner and the timbre of voice, although he understands hardly a word of language proper. Every hospital patient, likewise, forms quick conclusions as to the man's character under whose care he comes, and instead of gratitude for the service rendered, the ungentlemanly physician is breeding through the community a condition of mind that bodes no good for medicine. The patient thinks himself sharp to secure some benefit from grudging surliness, and the over-worked, non-paid, half-excusable doctor is glad to get through his job in one or another wretched way. "He has the European habit and style" — such is the patient's verdict. The patients know well enough when they are looked upon as "clinical material," and when on the other hand they are sympathetically treated as unfortunate human beings, whom we have the *privilege* of helping.

* * * * * * *

And what brutal injustice is the indiscriminate treatment of hospital crowds to the younger members of the profession, and to those, the immense majority, who are not of the elect,— the poor fellows who are neither professors, chiefs, nor visiting physicians; it is among the lay poor that the professional poor must work. After years of heroic preparation the young graduate finds the very teachers who have taken his money for instruction, treating questionless and gratis those who should be his own pay-patients. I have a profound sympathy for the young and unsuccessful physician. He has been outrageously deceived, and is daily being outrageously treated by men of his own guild, to whom he has a natural right to turn for aid in this matter. If he settle in the country, the recklessness of the city hospital and dispensary government pursues him like a fury. The non-discriminating urban physician receives the country patient without question. It is thought that the distance from which the countryman comes cancels all scruples

as to duty to one's colleagues. Medical ethics have at best very narrow geographic limitations. Only the countryman's local physician knows whether he is able to pay or not — but how often is the matter asked about by the city brother? Even in private practice the rights of the distant local physician are but little considered; how much less, then, are they considered at the dispensary?

* * * * * * *

Let us briefly consider the treatment of the disease. What shall be done, what can be done, to abate this graceless nuisance? A thousand good hearts and wise minds are racked by the problem. It is almost impossible to find a way out. In fact, we have gotten ourselves so pitiably diseased that we can hardly hope for much else than a life of chronic invalidism, at least so far as this generation is concerned. The disease, if one may so speak, is intensely chronic. One thing is certain, we cannot make men moral by act of congress. There is not one great general remedy. Every one of us must take the matter up. The Kingdom of Heaven is within you. The influence of one, of each individual, steadily and patiently opposing the wrong will, in time, transform the whole. Every one of us has power; each one of us has been a sinner; each one may do little or much towards stemming the evil trend.

And first as to the endowers, whether individual or communal, let us preach incessantly and repetitively the truth that indiscriminate charity is unadulteratedly sinful and cruel. Every penny given without inquiry as to merit is simply hiring people to be sufferers.

* * * * * * *

We must teach the rich that every endowment of hospitals and dispensaries must be conditioned, narrowly, rigidly conditioned upon the law that only emergency cases and the absolutely deserving poor are to be treated in hospitals. When importuned to contribute on hospital Sundays, or to attend entertainments, charity balls, etc., etc., let us refuse and publicly refuse, unless the managers of such hospitals publicly state that rigid exclusion of those able to pay something for medical services is carefully and systematically assured.

The indiscriminateness of the doled-out charity of the hospitals is a natural result of the stupid indiscrimination of endowers. These pour out the money, year after year, and century after century, in reckless disregard of the laws of economics, of the real needs of the community, and of the experiences of other lands. Hospital farms for epileptics, for the insane, homes for convalescents, homes for the dying, special

hospitals of various kinds, especially for the tuberculous,—these and more are pitifully wanted, and yet the old ways and the old evils are stupidly increased.

* * * * * * *

As to the public, every one is a teacher, and may make his voice heard against indiscriminateness. I plainly tell my patients, and the occasion arises nearly every day, that they cannot get as good medical service at the free dispensary as at the private office, and that private treatment is far cheaper than the treatment for which nothing is paid. I think it our duty to stigmatize the hospitals and give them a bad name. We can hardly exaggerate the truth in this respect. Let us laugh to scorn the clap-trap delusion of the masses that at the dispensary they will be treated by the great Professor Bigwig, and that therefore they will be better treated than by yesterday's graduate, Dr. Nobody. We, of course, know the silliness of such an illusion; we know that often at the hospital Bigwig gets all the honor and young Nobody does all the work. Ten to one, with his care and desire to establish a reputation, young Nobody would do the better work of the two, even if Bigwig had the case himself. Then there is the wasted time of the patient, the crowds, the shocking surroundings, the shame of being a pauper! Let us use the blunt, brutal word, and drive it into their heads,—*hospitals and dispensaries are for paupers!* It will hurt a little, but it will do good. Every older physician has some younger friend and colleague who needs the poor patients and their poor fees. Why not do the patients and the friend a real service with one word of advice?

As to the profession, if one has anything to do with a hospital, one can do not a little in the interest of discrimination. A trained mind can learn to detect the old clothes put on for the visit, the odor of whiskey, the concealment of ability to pay something. There should be no mincing of words with such folk. Every patient caught shamming should be half-insulted, and unceremoniously turned out. Let them go to "other places where they will be welcomed;" the "other places" will thereby secure for themselves an evil name in time, which will prove a poor investment.

There is one half-evil that is condemned by some, and practiced by many, but it has the excuse that it is somewhat better than the hospital wholesale business. The drug-store doctor is not perhaps the best type of professional man, but he is not so bad as Professor Bigwig. By the drug store doctor I do not mean the druggist who is not an M. D., but who in fact prescribes much as if he were. That problem is fast settling itself, by the commercial medical college selling diplomas to the

druggists. What is meant is the genuine doctor who also keeps a drug store, but who charges — well, nothing for advice and everything for filling the prescription! Such a product of our *fin de siecle* medical civilization is in fact a direct reaction and result of indiscriminate medical charity. And since the doctor gets something, however roundabout, for his work, I am not inclined to scold him much. When hospitalism is whipped out of the field, it will be time enough for all good men to turn in and run out the drug-store doctor.

* * * * * * *

One finally asks why should each physician not have his own private dispensary? Behold his empty office and his unoccupied time! Why should he deimpersonalize his charitable work and give himself namelessly to an institution — a sort of a corporation which proverbially has neither a body to be abused nor a soul to be saved? Better it seems to me, and far better, would it be to do the service and get the gratitude oneself. In such cases there is a real and a scientific service on the physician's part, and a real and not a sham gratitude on the part of the patient. Private individuals should go into private competition with the hospitals. The hospitals can be whipped out every time. And when one corrects the botch-work of the hospitals, the time and the health of the patient have been so patently spared that the thank-offering of an unexpected and shyly-given fee is much larger than one would have thought of receiving from a "charity case." One may perhaps hear the sneer that it would be unprofessional for a hungering young doctor to solicit gratis-cases at his private office,— and ten to one the sneer would come from one who hangs his name on big sign-boards from his dispensary doors, and advertises himself or his hospital in cheap newspapers and on theater bulletin-boards. I would be far from justifying advertising ways on the part of the younger man, but decidedly when the advertisement of the hospital means the advertisement of the men running the hospital, then I excuse the young non-hospital advertiser first and quickest. When Bigwig quits the trickery, young Nobody will soon do so also.

* * * * * * *

But when all has been said and done the hospital abuse will continue unless professional sentiment is aroused. Trustees, professional philanthropists, and the public, will gladly continue to eat the oyster of medical service, and leave the shells to our asinarian rivalries. Possibly there will be no great and thorough cure of the evil so long as we remain a divided profession, so long as local medical societies never touch professional abuses and wrongs, so long as censors have no moral

sense and are never incensed,—surely not so long as the American Medical Society numbers as members but one in a hundred American medical men. As certainly also there will be no reform while like a lot of unspanked school boys, the members of that Association hanker after and quarrel over the right to advertise nostrums and to associate with quacks, and while the cynical wrap themselves in the cloak of respectability, hold themselves aloof, and grin sardonically from the safe retreats of success. The two immediate and demanded conditions of all reform are :

1. That medical men shall have a large share in the government of hospitals, thus making them responsible for abuses and rendering it possible to stop this old monkey trick of getting chestnuts by our stupid professional paws thrust into the fire.

2. The principle of the Charity-organization Society must be made a part of all hospital management. It would be well if a genuine co-partnership could be realized between the local Charity-organization Society and every hospital. At least, there must be at every hospital an officer whose sole duty it shall be to discriminate between the worthy and unworthy,—and he must be made to discriminate, too.

Some two months since we mailed to two hundred physicians in Boston and vicinity the following :

MY DEAR DOCTOR : —

What in your opinion is the best method of correcting the abuse of Medical and Surgical charity as now existing in the large institutions in Boston? We say Boston, because the conduct of these institutions affects not only the practitioners of Massachusetts, but of all New England. Are you willing your answer should be published?

We have received some fifty replies. Those most deeply entrenched in the large hospitals have very little to offer. *You* are invited to send us *your* opinions on this abuse.

In the direct line of this work is Dr. Gould's excellent article, extracts from which we publish in this issue. A later issue will contain some of the results of our letter of inquiry.—[ED.

Further Observations on Convergent Squint.

In my paper on "Crossed Eyes," read before the New York County Medical Society, May 28, 1894,* I endeavored to state my views on this condition, the deviation of the optic axes, referring particularly to convergent strabismus, and in which I divided all the cases that come under our observation into two great divisions or classes, namely: First, squint, with congenital amblyopia; and, second, squint, from relative hypermetropia with possibly, psychical suppression of the visual image in one eye, from non-use.

I wish to make a clear distinction between these two classes, as in the second class we do not have amblyopia; as I believe that in these cases the vision may be improved, if not completely restored, by atropine and suitable glasses, or combined with a simple tenotomy if necessary.

Since the above paper was read I have examined many cases in my private and clinical work, that have all confirmed my previous observations.

I will now present my method of treatment that up to the present time I have found very satisfactory.

Professor C. Schweigger of Berlin writes an excellent article on the "Results of the Operation for Strabismus," published in *The Archives* for January, 1895, but he does not separate his cases, and I cannot see how we can come to any correct conclusions as regards the results, unless we make a distinction between those cases who squint because they connot see with the deviating eye, and those cases who squint because they can see better by stimulation of the centers of convergence.

If we accept the theories advanced in the first paper, we may carry out a fixed plan of treatment, and the first question arises as to the advisability of an operation.

When shall we operate on those cases? And what operation shall we perform?

Let me first illustrate this paper by a case of the second class—squint with relative hypermetropia. Now, we have a strain on the ciliary muscles from the axial hyperopia, that can only be overcome and vision made satisfactory by excessive convergence of the visual axes, periodic at first, but slowly becoming constant, until one eye turns inward and will no longer follow the other eye. As a result, in time, we find a physiological suppression of the blurred images found on the retina of

* See The Refractionist of March, 1895.

the converging eye. This suppression may reduce vision to about 20-70, but seldom more than 20-100, and I believe that if you can again bring the squinting eye to a position in which it will fix the visual line on the object with its fellow eye, then the mental impressions will slowly re-assert themselves and the visual acuteness improve. In other words, the brain or visual centres will begin to appreciate the stimulation of the terminal elements of the retina and the vision will return.

If this be true, let us commence our treatment of this second class, first, by the use of atropine to put both eyes fully at rest, correct the full error of refraction by suitable glasses, and if the convergence be corrected, our work is performed, except that we must reduce the power of the correcting lens when the use of the atropine is stopped.

On the other hand, if this method fails, we must proceed to perform a simple tenotomy; and just at this point I would make the warning statement that in just these cases if we decide to operate, we must do so very carefully or we may have an over correction, very difficult to relieve. I may also state, that immediately after an operation these cases are liable, at first, to have some slight diplopia, owing to the difficulty of fusing the retinal impressions, but this tends to correct itself in time.

If we decide to operate first, I would suggest a simple tenotomy on the squinting eye; and if that fails, to effect full correction; then a tenotomy on the fellow eye, carefully performed, that we may note the effect, as we must guard against any over correction. We will seldom need more than one or at most two operations before we will have the optic axes parallel, and then with the glasses properly fitted we will find the vision slowly improving and binocular vision as a final result.

Assuming these directions for treatment of the second class of cases as correct and certainly easy of trial and execution, let us now turn to the most numerous and common cases, those of our first class, in which I shall endeavor to demonstrate a different line of treatment from the foregoing; and also, to suggest to you a new operation for advancement or shortening of a muscle, that in my hands has given me entire satisfaction and success in all my cases.

By squint of the first class I mean convergent squint with amblyopia—usually congenital—but I include in this class all cases of squint from any cause, in which the vision may be materially and permanently reduced in one eye.

In these cases, I have claimed that we have almost perfect vision in the fixing eye, and in the squinting eye we have vision very much reduced, as to 20-100 or less, not due to any psychical exclusion of

vision; but a simple congenital amblyopia; and also, in the above cases, I claim we have a normal balance of power in the lateral moving muscles of the eyes. In other words, the power of the interni is to that of the externi, as four or three is to one.

Now take away from an eye its guiding sensation or power to receive retinal impressions, and it goes without saying that the eye must naturally turn in the direction of the most powerful muscles, namely, inward. I have stated before that in these cases I do not think we have any *amblyopia ex anopsia*, and the many cases examined in clinical work seem to prove that this is no psychical exclusion of the vision, but that the condition is a clinical fact, probably congenital.

The eye cannot see distinctly, and so losing its fixation power, it is drawn inward by the powerful interni; while on the other hand, if the power of the externi equals or exceeds that of the interni, then under the same conditions of amblyopia, the eye will not squint nor the vision improve, as I have repeatedly proved by a careful examination of other cases, all other conditions being the same.

I think we may assume all the above propositions as established facts, and I am glad to say, that since my first paper setting forth these views, I have heard from other observers and they have noted the same conditions.

If then we have a case of the first class, the question of treatment comes under our consideration, but our object can only be for the cosmetic effect, we may look out for the restoration of the vision in the amblyopic eye. Here we need not try the preliminary effect of atropine and the glasses, as they will not, under any conditions, help us to restore the amblyopic eye.

I believe our only recourse lies in a suitabe method of operation, which will place the squinting eye in a position to follow the fixing eye. In other words, we must make the opposing lateral moving muscles equal in power.

In many of these cases a simple, free tenotomy upon the internus of the amblyopic eye will be all that is necessary to accomplish our object; but if not, then comes the important question of the second operation. Shall we proceed to operate on the internus of the fixing eye, or shall we shorten the externus of the squinting eye?

In the light of my past experience, I am inclined to think that an advancement or shortening of the externus of the squinting eye will be decidedly the better, or, in other words, let us only operate on the squinting eye by simple tenotomy of the internus and the shortening of the externus, that we may not disturb the balance of the lateral moving muscles of the perfect eye.

The question now being the manner of advancement or shortening the externus; or, if a divergent squint, of the internus. I have lately modified the operation, by which I "take a tuck," as it were, in the muscle to be shortened and do not cut it loose from its attachments.

This operation is performed as follows: Deciding upon the muscle to be shortened, I make a horizontal incision in the conjunctiva, over the insertion and muscular fibres, and expose the muscles freely with two strabismus hooks. I then take a small curved needle, armed with No. oo fine catgut suture, sterilized, and pass the needle through the lower part of the tendon, close to the sclerotic. As the needle comes out beneath the tendon it is again taken in the holder and carried backward beneath the belly of the muscles, and brought out from within outward; I then carry it across the muscle above, and at an opposite point to the last puncture, the needle is passed through the muscle from without, inward, then carried back to the tendon and beneath it, the needle comes out through the tendon, above the first puncture and is drawn through and cut off.

We may now tenotomize the opposing muscle, if necessary, and then proceed to tie the suture. This is done by taking the two ends and tying them with a surgical knot over the tendon, and as it is drawn tight the muscle is shortened with the enclosed part of the muscle drawn up in a fold "*like a tuck.*" When sufficiently shortened, so that the position of the cornea is correct, we must complete the tie and closely cut off the ends. We now close the wound in the conjunctiva by a small black silk suture, if necessary, and leave the catgut suture to be absorbed, as there will be no necessity for its removal and very little reaction afterward.

I have also found this method of shortening very useful in slight cases of paresis of the muscles with diplopia.

It is not necessary to recite the cases in which I have used this method of shortening the straight muscles of the eye, as they have been shown in my clinic at the Post-Graduate Hospital. I will only state that I have used this method a number of times, and am very much pleased with the final results, while any reaction has been very slight.

It is particularly recommended in cases of heterophoria, slight paresis, and in the first class of cases of strabismus, as by this method we can at once obtain perfect and final parallelism of the visual lines, and by an operation on the amblyopic eye alone.

Let us sum up this paper with the following conclusions:

First, that we may divide all our cases of convergent or divergent squint into two great classes.

Second, that in the second class of cases we may temporize, perhaps with benefit, by the use of atropine and glasses, thereby avoiding any operative procedures, and if this fail, then a simple tenotomy may be necessary.

Third, that in the first class of cases we must operate at once, and if a simple tenotomy will not correct the deviation, then we may easily shorten the weakened muscle, as I have described by a simple operation which will be successful.

Fourth, that in all our operations the eyes should not be bandaged, but treated by simple cold-water dressings.—*Francis Valk, M. D., in The Post-Graduate.*

* * *

PEROXIDE OF HYDROGEN.

I HAVE used peroxide of hydrogen quite extensively for cleansing discharging ears, the nasal and accessory cavities, and have tried all the brands of the preparation in the market, and once thought one manufacturer's make as good as that of another, and bought the cheapest as a matter of economy, but recent experience has taught me that the difference in quality is greater than the difference in price. After an unpleasant experience with a solution of peroxide of hydrogen which severely injured the mucous membrane, I bought and examined, chemically, a bottle of each preparation of $H_2 O_2$ in the market, and was surprised to find so much difference. Some are useless, and others worse than useless because they contain too little available oxygen and too much free acids (phosphoric, sulphuric, hydrochloric). I now order Marchand's (medicinal) exclusively because I find it contains the desired quantity of available oxygen and not enough free acid, to be objectionable, and its keeping properties are all that could be desired.

By inquiry I learn that Marchand's is the preparation that is used by almost all surgeons, and it is considered by them the standard.—*J. P. Parker, Ph. G., M. D., St. Louis, Mo., in the Annals of Ophthalmology, April, 1895.*

—My personal experience with peroxide of hydrogen confirms entirely the statement of Dr. J. P. Parker. I have used exclusively Marchand's brand until lately, when I experimented with hydrozone. Then I gave up entirely the use of peroxide of hydrogen and use hydrozone on account of its strength, which cannot be compared with any other brand, even Marchand's. I must say that the results which I obtained with hydrozone are most gratifying.—Ed. *The Times and Register, June 8th, 1895.*

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. SEPTEMBER, 1895. NO. 6.

SHOULD NOT OCULISTS BE MORE CAREFUL IN PRESCRIBING COLORED GLASSES?

BY W. L. BULLARD, M. D., COLUMBUS, GA.

DOUBTLESS all of you are cognizant of the fact that our text-books (the most of them at least) fail to give any advice as to the wearing of colored glasses, save as a protection to bright and reflected lights. Soelberg Wells[1] says "Eye-protectors are found of much service to guard the eyes from very bright light, dust or cold winds. The best are the medium blue curved. Moreover, the blue color, on account of the more eccentric position in the solar spectrum, makes a less impression upon the retina. Smoked glasses are not so good, and they more or less subdue and diminish the whole volume of light and color, and thus render the image somewhat indistinct." Mittendorf[2] says that "The use of colored glasses is indicated in all affections of the eye in which the irritating effects of bright light is to be avoided. Corneal, iritic, retinal, and some forms of conjunctival diseases call for their use, and in these cases blue glasses are especially useful. Such glasses ought to have the shape of shells, and are called coquilles." Noyes[3] says "We first speak of protection of the eyes from hurtful influences, viz., from dust, smoke, glaring light, and extreme heat, by colored or transparent glasses. Protective glasses are known usually as coquilles, and shaped like a watch glass, and tinted London smoke or blue. The neutral tint is generally better than blue." Hartridge[4] tells us that "Tinted glasses are sometimes required for diminishing too much light, in case of irritation or inflammation of the retina, or of photophobia from various causes, as myopia, etc. In these cases light-blue glasses which cut off the orange rays are the best, but smoked colored are preferred by some surgeons." Meyer,[5] Lawson,[6] Carter and Frost,[7] Macnamara,[8] Landolt,[9] Juler,[10] and numbers of others that I might mention altogether

ignore the wearing of colored glasses in their respective works on diseases of the eye.

It is not of any particular color, however, to which I call your attention, yet I am fully convinced that London smoked glasses as a rule are more comfortable to a diseased eye than blue, and oftentimes have I tested patients, and invariably the smoked glasses would be the most preferable. Now as to shape, I beg to say that beyond all question they should be perfectly plain, that is flat; if so, the rays of light are not changed. It is this error in refraction that is artificially produced by the wearing of concave glasses, that leads me to ask, Should not oculists be more careful in prescribing or advising patients when needing colored glasses, to go to an optician or jeweler, perhaps, to select for themselves? As you well know, it is claimed, and truthfully so perhaps, that an error in refraction, equal to so low a degree as one-half dioptry, is liable to bring on asthenopia, accompanied at times by its kindred, to wit: Epilepsy, chorea, headache, indigestion, etc. Moreover in the examination of an eye, should we find ametropia equal to this low degree of refraction we unhesitatingly advise its correction (for fear of eye-strain or its evil effects) even if no asthenopic trouble is realized or complained of by the patient. If this be true, why advise or let a patient with inflammatory trouble of the eye wear glasses that will cause or render the eye ametropic, taking it for granted that they are emmetropic to commence with. Now, I have here half a dozen pair of colored glasses which were handed me by an optician in response to the question Will you let me have a half dozen pair of perfectly plain colored glasses? When tested I find them to be curved shaped, and one-fourth dioptry and over astigmatic, with myopic focus. I mailed out of this number one pair to an expert optician of Philadelphia, Pa., and asked for its refraction or strength, and the following are his words: "I find the glasses or lenses full of bubbles and scratches, and still more, they have a one-half cylindrical motion, and a myopic focus of 37 D." I also have here a flat or plain pair of smoked glasses which has no refractive power, which I invariably prescribe, and to my mind should be the kind advised for those needing colored glasses. In conclusion, I beg to say that I trust some of you who have won celebrity and influence will become interesed in this matter which has so long lain dormant, and bring about a correction of this great error and evil.

[1] Diseases of the Eye. [2] Diseases of the Eye and Ear. [3] Diseases of the Eye. [4] Refraction of the Eye. [5] Diseases of the Eye. [6] Diseases and Injuries of the Eye. [7] Ophthalmic Surgery. [8] Examination of the Eye. [9] Examination of the Eye. [10] Ophthalmic Science and Practice.

MYDRIATICS NOT NEEDED.

By THOS. M. STEWART, M. D., Cincinnati, O.

EXPERIENCE is the best teacher in this question as in all others. Aside from the method we usually employ or would prefer to employ, we sometimes find it necessary to forego our preconceived notions and depart from orthodox lines.

The following brief report of a few cases and a summary of others will show the possibility of *satisfactorily* testing eyes without dilating the pupil and without paralyzing the accommodation. In each of the cases herein reported mydriatics were advised but refused. The examination was made with the understanding that a re-examination would have to be made under the influence of a mydriatic should the glasses prescribed fail to relieve the dull sight, headache and eye pains. To shorten the report of the cases it might be well to state that each case was examined with the test lenses, test-letters and astigmatic dial; the stenopaic slit; and the ophthalmoscope. The findings by these methods were carefully analyzed and their correctness proved by trial of the glasses before making the prescription.

Case I. Miss V., age 21, seamstress. Complained of headaches and dullness of vision after a few hours near work. Duration of symptoms eighteen months. Had been using a + 0.25 cylinder axis 90° for the six months with an aggravation of the symptoms. Vision in each eye 15-40. Examination revealed a simple myopic astigmatism. Prescribed a — 0.25 cylinder axis 180°. In one week patient reported for approval of the frame and the lenses, she stated the headache had vanished and that she could see better to do her work. In six months patient reported entire satisfaction with the glasses, and an examination proved the eyes to be in the same condition of myopic astigmatism as at the first examination.

Case II. Mr T. L. C., age 25, book-keeper. Some confusion at near work, figures run together. Vision normal at a distance, except that some letters were miscalled. Diagnosis, hyperopic astigmatism in left eye and hyperopia in the right eye. Prescribed a + 0.25 cylinder axis 120° for the left ege and a + 0.5 spherical for the right eye. Frames and lenses approved on the fourth day, and in five months a re-examination showed the condition the same, with the patient relieved of all trouble at near work.

Case III. Dr. A. S., age 48, a dentist. Complained that he had to draw away from his work to see clearly, and on reading he was obliged

to hold his book or paper farther off than was comfortable. Of course all will recognize presbyopia or old sight from the symptoms here given, but several years previously I had examined this same case and found a simple myopic astigmatism. The presbyopia modified the trouble so that for near work a + 1.50 cylinder axis 90° gave entire astisfaction, and has done so for a period of thirteen months.

CASE IV. MISS F. S., age 24, music teacher. Complained of confusion of notes when reading music. Each eye showed a vision of 15-40. Hyperopic astigmatism was diagnosed, and corrected by a + 1. ⊂ + .50 cylinder axis 90° in the left eye, and in the right eye the same combination with the axis 105°. Eight months subsequently the case was seen and the eyes were in excellent condition, with entire satisfaction on the part of the patient in the use of the glasses.

CASE V. M. G., aged 24, seamstress. Headaches every day, drawing pain in the eyes when sewing, a great effort is required to continue working as she is compelled to do. Diagnosis, mixed astigmatism. Corrected by + 1.25 ⊂ — 2.50 cylinder axis 135° in the right eye, the same combination in the left eye but with the axis of the cylinder at 45°. Reported for approval of the glasses and the frame, with the statement "Can see splendidly. Everything clear and distinct. No headaches since the second day's use of the glasses." In five months patient had no complaint to make and the eyes were in splendid condition.

Fifteen other cases are shown on my records during a period of thirteen months, all of them examined without paralyzing the accommodation. In all of the cases a *satisfactory* correction was made and re-examination at the end of six months or more showed the eyes to be in good condition and to have suffered no damage from the use of glasses prescribed without a mydriatic. In none of the cases was any change made in the glasses after they were prescribed.

I do not mean to urge the correction of all refractive errors without a mydriatic, but I do assert that this is a simple statement of what *was* done in twenty cases.

"From principles is derived probability; but truth is obtained only from facts."

The Refractionist.

A Journal of Practical Ophthalmology.

FRANCIS F. WHITTIER, M. D., Editor.
74 Boylston Street, Boston.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.
Address all communications to the Editor.

An Association of What?

In the current number of the *Optical Journal* we notice that the proposed convention which was to have been held in New York, September 25, to arrange for a National Association of Opticians, has been postponed. At the formal meeting all of four were present, which number was increased at a subsequent meeting to nine. There were not enough of the representative opticians present to warrant the election of a chairman, or an organization. Straight opticians who confine themselves strictly to filling oculists' prescriptions, probably will be careful how they are made the cat's-paw of a class of people, from the person who tries to fit presbyopes only, to the wandering drug-store optician and the fake who tries to adjust glasses by feeling the pulse.

Mr. C. F. Prentice, who was present, and whose articles in the past show what he might have done if he had pursued a medical course, said in substance :—

"For the past few years my attention has frequently been called to the subject of organization among opticians, and, perhaps, like many others of you who have been similarly approached, I have been perplexed to know just what attitude to assume when the time for final action had been reached. In deliberating on the subject, the first question which presented itself to me was: Would such organization serve a beneficial purpose? This involved still another question: What object should this organization strive to attain? In accepting Mr. Boger's invitation to be present tonight, I do so in the hope that we may together consider these questions carefully, before inviting others to join us in a formal meeting. On previous occasions I have declined invitations of this kind, because I failed to find a sufficient number of prominent and reputable opticians among the agitators. Through Mr. Boger's persistence I am pleased to find that some of our leading New York opticians are now present, so that I avail myself of the opportunity of saying that I am prepared at least to assist in forming an association of opticians either state or national, provided the objects are :—

"First,—That the motive shall be to elevate the optician to the highest scientific proficiency of his calling. By this means opticians must

eventually secure that universal respect which, it is to be regretted, is not now accorded them as a class.

"Second,—For the purpose of bringing reputable opticians into friendly communion with each other. By this means we may expect to remove the petty jealousies now existing among many competitive opticians. What we need is respect among ourselves, before we can claim it at large. That we are opticians, we cannot deny; and let us not be ashamed of it, even though some incompetent and unprincipled optician may be vilified and paraded before us in print, as being representative of us all as a class. Let us do our own pruning, and be the judges of those who shall represent us as a class in the community. We are in a better position to know who is and who is not an optician than anyone else, and the sooner we draw the line in selecting our company the better. This difficult problem of discrimination is therefore also a grave one for us to consider. It is evident, if we are to organize with the objects in view mentioned, that the nucleus of the association must be composed of men of good standing, while the success of the undertaking will rest entirely upon their loyalty to the principles here advocated. We know that strength is to be secured in well directed organization. Of this, we have had many examples in its application to other branches of trade. Generally speaking, trade associations have less lofty motives than those which, in our particular case, I am willing to support. Personally, I am opposed to anything in the nature of a 'trust.' Our trade is one which requires something more than commercial ability,— it demands business sagacity, combined with a scientific knowledge. Increased demands for scientific ability are being made upon us more and more as time progresses, making it necessary for us to devote considerable time, beyond that which occupies us during business hours, for the purpose of acquiring the necessary technical knowledge. We therefore here find an incentive to organization, because it affords us opportunities not to be attained in any other way. Problems arise daily in our business, which would become interesting subjects for discussion. Besides, as a body, we could make demands upon those who supply us with merchandise, which would be respected and often complied with.

"I regret exceedingly that Messrs. Meyrowitz, Lembke, GaNun and Mundorff have been unable to favor us with their attendance tonight, and I would therefore suggest that we take no further steps toward organization until these representative gentlemen return to the city, when it is to be hoped they will co-operate with us."

The whole scheme was apparently hatched in the brain of Mr. Boger, editor of the *Optical Journal*, the real object not being very apparent.

After visiting Albany, Syracuse, Rochester, and Buffalo, with much prodding at home, he comes to the conclusion "that the time for organization is anxiously wished for and looked forward to by a large number of representative opticians."

At his first meeting he had four, but they did not seem to "represent" even a little bit. In his editorial he goes on to say:—

"The term 'optician' is defined by Webster as 'one skilled in optics' [Why not quote the whole? Webster gives this meaning as 'rare,' and we are obliged to say that the result of opticians' work is fast proving that it will soon be obsolete.—*Ed.*], or 'one who deals in optical glasses and instruments.' Webster is right. But we have many grades or classes of opticians, as all will admit. If we want a large and powerful organization, we will accept as members all who come under the title. In a national association such as we propose to start. we should strive to have a large membership and a small platform,— few objects and many to help accomplish them."

As to the objects of the association he says :—

"Now we come to debatable ground. 'What are the objects of the proposed association?' is a question that has been put to me during my round of visits by nearly every optician. In no case did I give a definite expression, but endeavored to get the questioner's opinion as to what its object should be. One man would say that its object should be to restrict the optician to making frames and lenses and putting them together, — filling oculists' prescriptions. Another would say, the optician should limit himself to fitting presbyopic defects only, and leave hypermetropia, myopia, and astigmatism for the oculist. Another says fit all optical defects of the eye with lenses. Another, in cases of astigmatism the optician should use a mydriatic. One says, exclude peddlers and traveling opticians. Another, exclude the 'Professor,' the 'M. O.,' the 'Doctor,' the drug-store optician, the dry-goods store optician, the fake optician.

"And so it goes. Out of five hundred opticians, I can get possibly five hundred totally different opinions as to what the purpose and object of this association should be. I know because I have seen them— talked with them. Every day I receive letters from them from all parts of the country. The man in Squeedunk, Iowa, writes that he is bothered with a patent-medicine man who gives medicine to do away with eyeglasses and robs the honest optician of his patients. (God help his patients!) Another fellow in Wildvalley, Maine, writes to ask where he can procure atropine, and how many drops can safely be put into the eyes of a young girl eight years old.

"Now, as a class, opticians are intelligent, progressive, scientific, honest, and capable. There are fools amongst them, there are frauds amongst them; but the fools and the frauds are not one-hundredth part of the opticians as a class. *But the fools and the frauds have a way of keeping prominently before the public to the detriment of the profession at large.* Oculists are beginning to scoff at the optician, and, to point an example, expose some fool or fraud optician. Newspapers take up the subject and the public is led to mistrust. Then the whole profession suffers. Why? Because the finger of scorn is justly pointed at some wolf in sheep's clothing — some 'optician.'

"Now, *here* is why we need the organization. We want to uplift the profession; to ward off the insinuating menace that threatens us, because the optician has only the standing that he makes for himself individually. 'O,' says one optician, 'I don't need to go into any association.

I am well known, long established, highly respected, and with a large business.' But I follow one of his customers, a farmer, to his home, a few miles from the city. The glasses he just received are new and strange and sometimes he fears they are just a mite too strong. Along comes a stranger who hands him a card: 'Professor Google-eyes, Magic Oculistic Optician,' who ingratiates himself into the farmer's favor. and fits him out with a pair of fake glasses, which he persuades him are more suitable for his eyes—the glasses are made of some marvelous product known only to his professorship, while the 'well known, highly esteemed' optician in town gets a roasting for having sold such 'worthless trash.' Later on the farmer man, whose eyes become worse, consults an oculist and relates his experience, and you may just bet your last penny that our oculist friend convinces the farmer that opticians are frauds. If he is like one Philadelphia oculist he will happen to know of only *one* optician in the whole universe who is able to even make the proper glasses after his prescription.

"This is why we need organization. One hundred fools and one hundred frauds can leven the whole optical business to such an extent that the public and press will believe them all fools and frauds.

"The details of minor matters can be arranged and determined upon at the annual convention. Whether an optician should be required to pass an examination, and what the examination should be, should be left to the convention. What we need is an organization, an honorable, respectable and large body, so that when the optician is held up to scorn or ridicule, as incompetent, ignorant, and so forth, the American Association will be a power to prove his skill and proclalm his knowledge.

"And, furthermore, when the time comes, as it surely will within not many years, that the legislatures of the several States are called upon to limit the sphere and circumscribe the power of the refracting optician, the American Association of Opticians will be called upon to frame the laws, instead of any body of doctors, politicians or wire-pullers."

What nonsense! And still some of our leading oculists encourage this by patronizing the refracting optician. Philadelpha is not alone in having an oculist that thinks there is but *one* optician in the world. This thing will continue till the oculists *demand* that the party who fills their prescriptions does no refracting, not even for presbyopia. The mistake has been made in the past by some writers of text-books in ophthalmology that possibly the optician could adjust glasses to the presbyope. This, in our opinion, is a dangerous admission, especially with our present light in ophthalmology. It may have done for a few decades ago, but such assertions should not be allowed in text-books of the present day.

There is but one position that we as physicians should maintain in this matter, and that is the sharp dividing line between the oculist and the optician. We may have reiterated this in these columns before so many times that many of our readers may wish that we would take a vacation,

but the writer is in a position to see the need of this more than the average oculist, owing to personal correspondence and items claiming his attention. Only recently our attention was called to the care (?) of the eyes of the students in one of the leading female seminaries of New England by a travelling optician (?) with his ophthalmometer, right from the World's Fair. What a disgrace that our educators are not educated in this line. Today we notice that the trustees of a State Reform School in California have engaged another of these wandering specimens, on salary, to examine each boy and girl in the school, some five hundred in all, and this in a state where so much pioneer work has been done in this line of work (educating the people in reference to how to take care of their eyes) by our associate, Dr. Southard of San Francisco. We had a pleasant call from Dr. Ellis, editor of the Southern California Practitioner (Los Angeles) when East to attend the annual meetings. On returning home he sent us a Prospectus of the Medical Law they are trying to have passed in California, which, if successful, will place refraction work in the hands of physicians—its proper place. Dr. Hawley of Chicago, whose articles appear in The Refractionist from time to time, also favored us with a call, and states that the physicians of Illinois are also agitating the question of having some restrictions placed on the non-medical care of the eyes. We are in hopes that there will be a combined effort in all the states to stop the work of non-medical men. Are *you* with us?

Selections.

Insufficiency of the Orbital Muscles.*

The term asthenopia, according to its derivation, means weak power of sight, but Donders describes it as a peculiar condition consisting of more or less inability to use the eyes continuously for close work without the occurrence of one or more of the following symptoms: fatigue; a strained feeling in and above the eyes, sometimes amounting to absolute pain; blurring of the sight so that all objects appear indistinct; blepharospasm, lachrymation, photophobia, nausea and even vomiting and vertigo. To these should be added headache, either frontal, temporal, occipital or general. There is not necessarily any organic disease of the eyes, and the cause is usually to be

*A paper by H. Bert Ellis, A. B., M. D., Los Angeles, Cal., Professor of Physiology, College of Medicine of the University of Southern California, read before the State Medical Society at San Francisco, April 18, 1895. Reprinted from "Southern Practitioner," August, 1895.

found in an error of refraction, generally hypermetropia or astigmatism. This has been called Accommodative Asthenopia, because other conditions will produce the same line of symptoms. For instance: irritation of the nasal mucous membrane, hyperesthesia and irritability of the retina, and inherent weakness of the extrinsic muscles of the eyes. There can be no doubt that the great bulk of asthenopia is accommodative in its origin; but insufficiency of the external muscles is another prolific cause of the symptoms mentioned before. Asthenopia, due to reflexes from the nasal mucous membrane, or irritable retinæ, is, I believe, comparatively rare.

How are we to distinguish the muscular from the accommodative? Primarily, is it nesessary to make a distinction? I think not, for in any given case of asthenopia our first care is to measure the refraction and test the muscles. If we find both at fault we should correct the refraction before treating the insufficiency; and very frequently, unless the insufficiency amounts to more than 2°, the correction of the error of refraction will relieve the asthenopia, and the question is settled. Too frequently, however, the question of muscular balance is taken no account of whatever, and this one fact I believe to be at the bottom of the great majority of our unsatisfactory refraction cases.

Granting that we have corrected the refraction of a given case and the symptoms still remain, or that we have a patient with insufficiency only, we then may be reasonably sure that the cause is muscular, and the question arises: "What shall we do?"

Let us briefly review the imperfect muscular conditions that may exist. Using the nomenclature of Stevens, we may have insufficiency of the external muscles, Esophoria; insufficiency of the internal recti muscles, Exophoria; tendency of one visual line above the other, Hyperphoria. This latter may exist, with either Eso- or Exophoria, giving us Hypereso or Hyperexophoria. Any of these conditions may occur in individuals who are otherwise strong and vigorous, but are more frequently found in those whose general health is impaired and whose nervous mechanism is out of repair.

The subjective symptoms do not differ materially from those produced by errors of refraction alone. They are, pains in the eyes on using them for any near work, and occasionally in fixing distant objects; this pain is frequently accompanied by headache, which may be fronto-temporal, occipital, vertical or general, and Noyes says that not a small percentage of sick headaches originate in disorders of the ocular muscles. There may be photophobia in varying degrees and blurring of print due to the tendency to diplopia, and occasionally dizziness.

If the patient be a neurasthenic or greatly run down from some prostrating disease, such as diphtheria, typhoid fever, la grippe or allied troubles, there may be a train of symptoms taking in all the aches and pains that flesh is heir to, including the functional nervous disorders, epilepsy, chorea, etc.

It is upon the objective symptoms that we must depend for our positive diagnosis of muscular errors. Having corrected the refractive error, we should first look into the muscular condition without calling the muscle of accommodation into action. Placing a small flame 6 meters from the patient, we may at once measure abduction, using Gould's Prism Battery. Place prisms bases in, in front of each eye, beginning with prisms of 1° strength; increase by 1° till the candle becomes double; should this occur before the total is 6°, we will probably find some error. For adduction place the prisms with bases out before the eyes, and by increasing the prisms over each eye 1° each move till the candle becomes double, we may quickly obtain the desired information. Adduction may normally be anywhere from 30° to 60°. The ratio should be 1° of abduction to 6° or 7° of adduction.

Place a prism of 7° in trial frames base down over right eye. Two flames should at once appear, one perpendicularly above the other; if the upper flame, which is the image seen by the right eye, be to the right as well as above, the images are homonymous, and we have weakness of the externi or abductors, that is esophoria. If the upper image be to the left, we call the images heteronymous, which indicates exophoria; that is, weakness of the adductors, the internal recti muscles.

To examine the superior and inferior recti muscles, darken the room and use a 10°, 15°, or 20° prism base in before the right eye. If the two images be not on the same horizontal plane, we have an error in one of the eyes; which eye a patient examination will reveal.

We may now bring accommodation into use and measure the muscular action at working distance. Use a prism of 10° base down in right eye of trial frames or holder, and look at dot on a line at a distance of 12 to 18 inches. Ordinarily we will find homonymous images 5° apart, but pay no attention to them; but if more, the condition needs treatment. Heteronymous images are always indicative of error and usually of the externi.

Having found the muscular insufficiency, what shall we do? Dr. St. John Roosa in his late work on Diseases of the Eye, says that although he formerly believed that asthenopia might be dependent upon insufficiencies of the external ocular muscles, he has finally come to reject it altogether. He recognizes the insufficiencies, but says they are depend-

ent on static fixed conditions of the eyeballs, and therefore it is not necessary to measure the relative power of the muscles. "It may be interesting, but it can do nothing toward a proper treatment."

In another place he says: "If the student will carefully correct the errors of refraction, he will have no need for tenotomies except for strabismus, nor for prisms except for paresis or paralysis of the external muscles." And to aid a logical conclusion to his dicta he says: "When we correct strabismus, we are always content with removing the manifest deformity dependent upon insufficiency of the muscles. We never cut and cut again for insufficiency of the muscles that the phorometer may declare. If those who advocate tenotomies for latent insufficiencies are right, they ought, by all the laws of logical deduction, to continue their operations here also, until muscular equilibrium has been reached. But all practitioners are, I believe, content with glasses to preserve the equilibrium of the eye and maintain the result of the operation, to wit, parallelism. This is what I advocate for muscular insufficiencies, or weakness due to the errors of refraction." From these quotations we must conclude that Dr. Roosa does not believe in asthenopia due to muscular inequilibrium; and furthermore, no muscular insufficiency short of manifest strabismus should be interfered with, beyond correcting any error of refraction that may exist.

Dr. Ernest Fuchs says: "Only those cases of insufficiencies which cause trouble or threaten to pass into strabismus call for assistance." Insufficiency of the interni requires consideration mainly, and this may be assisted by prisms before each eye, bases in. For insufficiency requiring more than 6° prisms, tenotomy of the stronger muscles is indicated.

Dr. George A. Berry does not even indicate a line of treatment, but rather leaves us to conclude that nothing is to be done till the latent becomes manifest squint.

If, however, we believe in the treatment at all, our first aim should be to put our patient in the best physical and mental condition possible; the refraction having been carefully corrected, we must stimulate the weak muscles, or quiet the excessive action or spasm of opposing muscles. Dr. Henry D. Noyes recommends a mode of invigorating the eye muscles which is especially suited to cases where all the muscles are feeble. The patient is provided with square prisms, one of 2 ½°, two of 5°, two of 10°, and one of 15°, and placed six meters from a candle flame. He begins adducting by placing the 5° prism, base out, before one eye, substitutes the 10° prism, then he places the 5° prism, base out, before the other eye, and substitutes for it the other prism of 10°. He may climb

further by adding the 2 ½° prism and then substituting the prism of 15° and so on till he adducts the full amount of 42 ½°. The patient may in the same manner give his abducting muscles gymnastics, the only difference being that the prisms will be placed before the eyes bases in, and he or she will probably not be able to overcome more than 10°. These gymnastics should be carried out twice daily, ten minutes each time, for several months.

Whenever abduction at 6 meters is as low as 5°, prisms, bases outward, may be prescribed for constant use; and Noyes adds that his conclusion, from recent experience, is strongly in favor of the helpfulness of weak prisms continuously worn, for moderate degrees of muscular error, and they have in his practice largely taken the place of gymnastic prisms. He formulates his rule for prescribing prisms as follows: "The base should be placed toward the image whose position is to be corrected, and this corresponds to the weak muscle, provided the physiological or functional action of the muscle is regarded. The apex of the prism, like a knife edge, indicates the muscle which should be weakened, and the base denotes the muscle to be strengthened.

Dr. George T. Stevens says about as follows: "Adduction may be greatly improved by gymnastic exercises of the interni by means of prisms. A prism of say 10° base out is placed before one eye while looking at a candle at 6 meters, when an effort is at once made to prevent diplopia. As soon as the images are blended, another prism, of perhaps less degree, is added. The images being united, a stronger prism takes the place of one of those already in use. Thus, little by little, the eyes are required to overcome prisms until the images can no longer be united. All the prisms are then removed and the process repeated, with probably a slight gain each time. This exercise should not last longer than six minutes nor be repeated more frequently than once daily. This is practically the method advocated by Noyes, which I called your attention to a moment ago."

Dr. Charles E. Michel develops weak interni in the following manner: Beginning with a 1° prism base in before the eye, he has the patient look at an object 6 meters away for four or five minutes, ten to fifteen times daily at first, later four or five times daily, but increasing the time of exercise by two to five minutes daily, and increasing the strength of the glass till 4° prisms are in use and can be worn with comfort, looking at a distance for one hour. Then the patient is instructed to read at first three to five minutes, increasing the time by two to five minutes daily until he can read comfortably one hour, four times daily. This exercise is kept up several months for half to one hour, three times daily.

Dr. G. C. Savage has a method which he calls Rhythmic Exercises, and which he considers useful only in cases where the heterophoria is less than 7°. In exophoria, where the internal recti are weak, the Rhythmic Exercises may be utilized by using a lighted taper held at arm's length in front of, and on a plane with, the eyes, fixing the vision on it strongly, bringing it to within 12 centimeters of the eyes and holding it there two seconds, then closing the eyes for a moment and on opening them directing the vision to a candle 6 meters away; the process to be repeated five to ten times at one sitting, and having two or three sittings a day for several months.

The same object may be attained by using prisms, bases out before each eye. One-degree prisms should first be used, substituting stronger prisms as the muscles grow stronger. The candle is placed 6 meters away, and the patient looks through prisms five seconds; they are then lifted for five seconds, then replaced, then removed, and so on from two to ten minutes, but never to the extent of fatigue. The sittings should be repeated from two to five times daily for months. In esophoria, where the external recti are insufficient, prisms only can be used; and they must be weak, only from .50° to 4° with their bases in; in other respects the procedure is the same as in exophoria.

If the case be one of left hyperphoria of not more than 1.5° it is possible to develop vertical orthophoria. The left inferior and right superior recti muscles are to be developed, and this may be accomplished by placing from 0.50° to 1° prisms base up on right eye, base down over the left eye, and going through the same rhythmic exercises as in exophoria.

Dr. Geo M. Gould believes that every case of exophoria, and possibly of developed strabismus, is certainly and quickly curable by a rapid and common method of ocular gymnastics and absolutely without operation. His method is to carry the loaded stimulus of convergence slowly beyond near range vision—that is, from punctum proximum to punctum remotum—and by repetitive gymnastics fixing it there. To illustrate, he says: "A patient is before us in whom we have determined a power of adduction at 6 meters, of only 10° instead of the 30° to 35°. He should have an abduction of 6° to 8° and a manifest exophoria of 6° to 8°. Put in the trial frame prisms 10° bases out each eye, and let patient firmly fix upon a small, bright object, held at a distance of 30 centimeters from his eyes, slowly recede, the patient keeping his gaze riveted on the object. If diplopia arise, return quickly to the patient and repeat. In normally healthy young persons or young adults, one will usually at once be able to carry the object 6 meters away without producing diplopia. Two or three repetitions of this will enable the patient in a minute or two to look all about the room without double vision."

The prisms first used may frequently, with advantage, be not more than 5° strength, and the power of adduction may be quickly doubled. Five to ten minutes several times daily, should be utilized in this exercise, with a little reading each time, then if the defect be low and health good a few days' treatment suffices. If, however the health be poor with high degree of heterophoria the return to normal balance is slower, from two weeks to two months.

Some of our text-books on ophthalmology contain no word on treatment of insufficiencies; other works which I have not mentioned give much the same line of treatment that I have credited to Noyes. There may be other lines of treatment with which I am not familiar, and if so I hope they will be mentioned in the discussion.

Most of the lines of treatment here referred to proceed on the supposition that the error lies in a deficieney of power of certain pairs of individual muscles. Gould controverts this idea and bases his treatment on the theory that, in the vast majority of cases of esophoria, the seat of the difficulty is purely, at least primarily, and always principally, central and innervational.

I have not given you an exhaustive paper either as to the diagnosis or treatment of muscular asthenopia, partly because time is limited and long papers are not appreciated, and partly because the practical points are what the practitioner desires in a paper.

I have had some experience with all these lines of treatment, and I have not been perfectly satisfied with any of them. In looking over my case book I believe I have had my best results in exophoria by Dr. Gould's method.

In measuring adduction and abduction and in developing adductors and abductors, I use Gould's "Battery of Prisms," and find them exceedingly useful and convenient. I hope that this paper may stimulate discussion, and bring out your opinions, to the end that a better line of treatment be devised for the present (to me) very unsatisfactory methods.

107 N. Spring St.

* * *

Commissions. We were recently told by an optician of respectability in the commercial world, that very many oculists—he named a proportion that seems incredible—demanded and received commissions upon the price of glasses purchased by their patient; and that some who rejected the gross "divvy" of money, and even the less patent commission of "special discounts" upon their own purchases, yielding to the insidious form of bribery involved in the

recommendation of patients by optician to oculist, upon an "understanding" that the patients should be returned by oculist to optician for lenses. It was further said that the practice was not considered disreputable by either party.

Upon inquiring as to the truth of these statements, an ophthalmologic friend, likely to know the facts, sadly admitted that our informant was probably correct in the main; although he doubted the accuracy of the latter's figures, and strenuously denied that either the practice or any one known to be engaged in it was "considered reputable."

Like the taking of commissions from druggists, or from the makers of trusses or other apparatus, this commercial relation between oculist and optician merits only condemnation. There is no possible excuse or justification for it, and the censors of medical societies ought to discipline any member of such societies who thus degrades his profession, no matter how powerful or prominent the culprit may be. Unless ethical rules are enforced, the degradation of medicine to the trade-level cannot be prevented.

When a commission-taker is called to account he usually presents two excuses. The first runs somewhat thus: "Why, Dr. Biggun does the very same thing. I know Specs & Prism have paid him thousands of dollars—Specs told me so himself." The other excuse is more pitiful: "It's all well enough for Greatman, whose office is crowded, to refuse commissions, but my office is not crowded, and I have a wife and children to support." To point out that evil example is to be shunned, not followed; that the profitableness of wrong-doing does not make it right-doing; that Big-gun, despite his notoriety and position, is despised by all whose good opinion is worth having; that Greatman's success is due to his character as well as his skill; will too often prove unavailing.

The commission-taker continues in his course, hugging to his breast his poor, futile excuses, but probably despising himself in intervals of clear seeing. After all, is the position of the optical bribe-taker any different from that of the trustees of the American Medical Association, who, in an official report, and without apparent shame, advanced as justification for the advertisement of nostrums in the Association's *Journal*, the same pitiful pleas?

"Others do it; we needed the money;" thus said the trustees—what breach of moral, or civil law, could not be similarly defended?

— *Philadelphia Polyclinic.*

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. OCTOBER, 1895. NO. 7.

SHALL OPTICIANS ATTEMPT TO FIT GLASSES?

BY MAURICE F. PILGRIM, A. B., M. D., CARBONDALE, PA., OPHTHALMOLOGIST TO THE CARBONDALE EMERGENCY HOSPITAL.

NOT long ago, in the course of a pleasant conversation, an esteemed medical gentleman said to the writer, "If the public wish opticians to fit glasses, why are you oculists not willing that they should do so?" Coming from a man who had devoted twenty years to the general practice of medicine, and who had only two years before been very active in his efforts to procure from the legislature of his state an act to protect the public and the profession against unqualified and irregular practitioners, the query seemed most extraordinary. It is not difficult to understand how a mere layman might propound such a query, because he would not be presumed to be advised respecting such matters. Such an explanation, however, cannot be made to do duty for medical men. If we are justified in predicating opinions upon outward, visible conduct, there are a great many medical gentlemen who are asking precisely the question above quoted, and who also answer it by permitting their patients to visit opticians for the purpose of purchasing glasses. In sanctioning, if not recommending, such procedure, they are doubtless actuated by commendable though mistaken motives, for it saves their patients the *present necessity* of paying an oculist an examination fee. But however praisworthy the motive may be, such sanction or indifference works a gross injustice to the profession — for the general practitioner and the oculist are of one professional blood — and *may* entail great and far-reaching injury upon the patient.

The question, "Why should not opticians fit glasses?" admits of an easy answer, by saying, "Because they are not competent." Such an answer possesses the merit of being direct, unambiguous and true.

Experience, however, admonishes the writer that it is far from being regarded as satisfactory to many of our colleagues engaged in general practice. There appears to be a desire upon the part of many of those gentlemen not only to have the query answered, but to have the *answer itemized.* Truth is many-sided, and, therefore, has to bear a great deal of counterfeiting. Oftentimes it is only when a subject is approached in a straightforward manner and looked "full in the face," that truth can be differentiated from error. Of nothing is this more true than of the subject in hand. For the consideration of such medical gentlemen as entertain opinions similar to that embodied in the query quoted at the outset of this paper, it is proposed to submit, *somewhat in detail,* reasons why oculists discountenance opticians who *attempt to fit glasses.* The words " somewhat in detail," are used advisedly, for, adopting the maxim that " the greater includes the less," it should be necessary to state but one reason, which is in itself conclusive as to the whole controversy.

Before proceeding further in the discussion, it may be well, in order to avoid confusion and possible misunderstanding, to pause and state to whom it is intended that the word " optician " shall apply. As a matter of fact, comparatively few *practical opticians* now attempt refraction work. They are experts in the art of grinding lenses, and limit their activities strictly to that important branch of work. Ophthalmology owes not a little to these men for their painstaking work, and it is a pleasure to oculists to make such acknowledgment. In their ranks are to be found men possessing not only fine mechanical genius and ability, but also of the strictest business probity. They put into their work both conscience and ability. Let it be understood, then, that this paper has very little reference to such men.

The word " optician,"* as used in this discussion, is essentially a misnomer, for, in the experience of the writer, very few genuine opticians — men learned in optics and who are competent to grind lenses — attempt anything else. Therefore, when the word is used in this paper, reference is intended chiefly to a class of jewellers, keepers of junk and curio shops, who style themselves " opticians," while, in fact, they are such only by self brevet. Many of them are men of the most shallow mental attainments, inconsequential members of society, and are not even mechanics, who, after examining a lens, would be unable to tell whether it were concave or convex. The majority of them have not the slightest idea of the *modus operandi* of lens-grinding. Thus it is that one finds in almost every small town or village, shopkeepers who sell

* The writer equally disapproves of the use of the term " oculist," preferring the name " ophthalmologist " as being more expressive and euphemistic. Inasmuch as the word " oculist " is more generally current, however, its use will be adhered to in this paper.

jewelry, cutlery, guns, sporting goods, etc., *including spectacles*, who gratuitously appropriate to themselves the title of "optician." Frequently the legend thrown to the breeze runs about like this: "John Smith, Jeweller and Optician. Eyes Examined Free." The flaming announcement would be more expressive and complete were it to go a step further and proclaim, for instance, "John Smith, Jeweller, Optician, Gunsmith and Junk Dealer. Eyes Examined Free. Jewelry and Guns Repaired. Junk Bought and Sold." In the larger cities, men of this commercial grade are usually of better standing in the intellectual and social scale, their business being mainly that of retailers of jewelry. They are, in fact, neither in the cities nor in the country, opticians at all, although for commercial purposes they arrogate to themselves that designation. It is with this class of men principally, rather than with the *bona fide* opticians, that it is proposed to deal in this paper. Because of the general acceptance and use of the term, and lacking a more appropriate word, they must be dignified in this discussion by the name tbrough which they are best known to the public, but to which they are in point of fact not entitled, viz., "opticians."

The great and all-embracing reason why those who are not physicians ("opticians" so called, mainly,) should not attempt to fit glasses *is because they are not competent to properly do such work.* But it is precisely at this point that the contention begins. When this reason is assigned, oculists are *virtually* if not actually, asked to particularize it. While that task is most cheerfully undertaken in this paper, it is proper to remind those who demand it, that no such itemization is required in the case of the prescribing apothecary. The oculist has no hesitation or difficulty in agreeing with the general practitioner that a druggist whose legitimate function it is to compound medicines upon the written orders of physicians, ought not to prescribe. Moreover, we have heartily coöperated with them not only in procuring legislation which prohibits the apothecary from prescribing, but also joined them in insisting upon its enforcement. We might, then, very pertinently inquire of the general practitioner, "Why should not a druggist prescribe medicines over his counter if the public wish him to do so?" Has the general practitioner any more forceful reason to offer than *that druggists are not competent to practice medicine?* The oculist does not insist upon a "bill of particulars" as to *why* they are not competent. Why, therefore, should the oculist be expected to furnish one when he objects to the optical apothecary (for what else are the so-called "opticians"?) who presumes to prescribe remedies for the eyes? And are not lenses when given to correct optical abnormality, quite as much "remedies" as

nasal insufflators, douches, atomizers and the like, or drugs? If lenses are potent for good *when properly prescribed and worn*, are they not also likely to produce injury if worn pursuant to an unskillful or improper prescription? If the possession of a diploma issued by a legally chartered and duly recognized medical college is required — and in many States a license from a State Examining Board in addition — before a person has legal permission to treat hemorrhoids or urethritis, why should not the individual who presumes to treat eyes be compelled to satisfy a similar requirement? Are not the eyes as precious and valuable to their possessor as is his rectum or urethra? Why should the law invidiously discriminate in favor of one organ of the human body to the absolute neglect of another?

Returning now to the proposed "bill of particulars," it is asserted as a general proposition *that opticians should not fit glasses*, because

First— They are not competent to properly do such work; and that their incompetency is due to three distinct sub-reasons:

(*a*) Lack of the necessary theoretical medical knowledge and training, for only an all-round physician, with special training for his particular branch, is held to be qualified.

(*b*) Lack of necessary clinical experience; and to the above must be added a third disqualification which, if the first two objections were removed would still leave the optician incapacitated for the work of treating eyes, *i. e.*:—

(*c*) Lacking diploma and registration, he is legally debarred from practicing medicine.

Doubtless the majority of refracting jewellers and opticians do not realize their limitations and general unfitness for the work of fitting glasses or the dangers to which their optical manœuvres expose the eyes of their patrons. It is rather the result of a confidence begotten and born of ignorance that inspires and emboldens their efforts. If they realized their limitations, it cannot be believed that many of them would have the hardihood or effrontery to assume the risks which they now shoulder with the utmost complacency. They assert that they "can fit eyes as well as the oculists," and doubtless believe it. In common with many of the laity, they do not realize that one who deals with ocular abnormalities should have that thorough knowledge of anatomy, physiology, pathology, and therapeutics that only the most carefully educated physician can be expected to possess. There are many physicians, also, it must be frankly though regretfully confessed, who do not realize this fact. Men do not become specialists in genito-urinary troubles, diseases of the nervous system, in gynecology, orthopedics, etc., etc., without

having first laid a broad and liberal foundation by a thorough understanding and mastery of the elementary principles and branches of medicine. Those who do thus presume are usually not physicians at all, simply quacks, and the profession at large so classify them. Why should one unlearned as to its anatomy, physiology and the possible pathological changes to which it is susceptible, be deemed fit to deal with the eye? Would it not be quite as sensible for a person suffering from a hernia to consult a shoemaker, a harnessmaker or a carpenter? Any of them *might* be able to make a satisfactory truss, but would be unable either to diagnose the kind of hernia or reduce it if it were recognized. Would any physician approve of their making the attempt? If not, why not?

Perhaps no organ of the entire body responds more quickly and in so many different ways to reflex influence as does the eye. Nor is there any organ that protographs, as it were, so many of the maladies having their origin or initial lesion in other and remote parts of the body, as does the eye. Oculists well know that frequently in nephritis, the retina gives indubitable evidence of the disease through the white patches deposited thereon long before the services of a physician are sought for the initial lesion. Many an unfortunate victim has first learned his doom — for retinitis albuminurica almost invariably means early death — through the oculist to whom he applied for a satisfactory pair of glasses. The writer now recalls a patient who exhibited twelve pairs of glasses given him by as many different opticians, none of which, he said, had proven satisfactory. Exploration of the fundus with the ophthalmoscope readily disclosed a congested disc and a retina studded with white patches and minute hemorrhages. The poor man had been making the rounds of the opticians' stores for six months, each time buying a pair of glasses that proved disappointing to him. The opticians were concerned only with his impaired eyesight; they saw nothing else and could think optically of nothing else. Being necessarily ignorant of the cause of the man's bad vision, they sought, by guessing, to remedy the defect with glasses. The oculist, however, saw behind the visual defect, *which was only a symptom*, a mortal disease, and referred the unfortunate man to his family physician for examination and treatment, without essaying the impossible task of improving his sight by glasses. Three months later that man was in his grave, having died in a uræmic convulsion! The prognosis of nephritis is, unfortunately, not a hopeful one, but who is the physician that would dare to affirm that if this man's malady had been recognized six months before — while he was making his perigrinations among the leecherous opticians — and treatment promptly instituted, that his life might not have been materially prolonged and

spared to a family that sorely needed his counsel? But his sole complaint to both optician and oculist was of failing vision. One man saw only an eye with defective sight and a chance to sell a pair of glasses; the other, *looking into the eye*, saw that the cause of the disturbed vision lay far beyond and outside of it and was one which glasses were powerless to remedy. The difference in the treatment coincided precisely with the difference in the training of the two men. One was a mechanic who saw, thought, understood, and acted as such; the other was a physician, trained to search for cause and effect, and not being simply an "eye man," recognized that the human body contained other organs, whose functions and influence were not dissociable.

The back of the eye is very often the seat of inflammatory affections, which in their early stages, give no external evidence of their existence except through diminution of vision. That is an almost invariable accompaniment of such disorders. There is a *condition*, rather than a disease, well known to oculists, which affects the inner portion of the eye and markedly reduces vision without giving the slightest evidence of its existence, except to the ophthalmoscopist. It is usually due to a weakened or diseased condition of the blood vessels consequent upon deficient elimination of vicious material from the blood. While the causes of this condition (which is not unlike apoplexy) may be multiplied, rheumatism and gout are perhaps the most frequently responsible for it. Old age often favors a hemorrhagic condition, through atheroma of vessels, with consequent infiltration on the retina and into the vitreous, presaging a not far distant attack of cerebral hemorrhage. But the initial stage of these and many other ocular abnormalities is marked by more or less failure of visual acuity. The writer has been cognizant of repeated instances where opticians have given glasses to people who were subsequently found to have been suffering at the time from some of the numerous ocular diseases whose origin is at the back of the eye, or not in the eye at all.* The patients' apprehensions were allayed for a while, and they were only awakened from their brief enjoyment of a security that was false, to discover that the opportune moment for saving sight or life had been frittered away in an *ignis fatuus* chase after incompetent opticians.

*Since beginning the preparation of this paper, the writer has been consulted by a patient who had just emerged from the sanctum of the *third* optician whom he had visited in an effort to procure relief for one of his eyes. Each optician had fitted him a pair of glasses and dismissed him with the soothing (?) assurance that his eye would "soon be all right." But as his eye steadily continued to grow "all wrong," he concluded that it were better to consult a physician. Examination revealed that *there was no trouble at all with the eye per se*, but that it was being injuriously affected by an abscess located in the antrum of highmore! Entrance into the antrum being effected by the removal of a tooth, the abscess was vigorously irrigated with antiseptics, which afforded entire relief in four days without an application of any kind being made to the eye itself. The man had been in the opticians' clutches for five weeks, and would doubtless have still been there had not the ocular pain grown to be no longer endurable.

It is in ocular diseases affecting the interior of the eye, such as optic neuritis, neuro-retinitis, retinitis pigmentosa, choroiditis, anæmia of the nerve head, atrophy of the disc, etc., etc., that the optical meddler finds his most productive field for evil. In the earlier stages, the evidences of these disorders are not reflected to the outward portions of the eye. Defective vision is, however, a very constant as well as annoying symptom. Persons with ocular trouble that affects the exterior of the eye, like conjunctivitis, keratitis, iritis or irido-cyclitis do not fall such a ready prey, because the optician seeing the inflammatory nature of the attack, usually refrains from dispensing glasses. Frequently they are so magnanimous (?) as to advise the patient to consult an oculist, and this is especially true if an inflammatory condition ensues after they have been tinkering with the eye. Some opticians very considerately advertise that they will inform their victims — customers — when they deem the services of an oculist necessary!

But we may be told that some of the opticians use the ophthalmoscope and "look into the eyes before fitting them." That some of them *affect* to do so, is quite true; but "looking in" and being able to see, or if seeing, *knowing* what it is that is seen and *what it signifies*, are very different propositions. The ability to do the one *may* be sometimes picked up by an apt person after a few hours' practice, whereas the accomplishment of the other requires the patient and persevering application of time that can best be measured by months and years and involves the examination of hundreds of eyes. Of what utility would it be for a blacksmith to put a stethoscope to his ear and attempt to listen to the sounds of the heart when he is unable to differentiate between a normal and a pathologic beat? Equally futile would it be for a jeweller to look into an eye when he cannot tell the difference between a normal and an abnormal disc even if he were lucky enough to focus one. He lacks that familiarity with the appearance of a normal eye that comes only after repeated examinations of scores of healthy discs.

But if the ability to do this properly were conceded to the optician, the whole question of the eye's relationship anatomically and physiologically to other parts of the body would at once confront and confound him; in other words, the entire domain of pathology and reflex influence would challenge him at every step as he proceeded forward to the most difficult part of a refractionist's work,—that of estimation and final determination. May we not properly pause at this point to inquire whether this is the proper sphere for the mechanic (optician) or for the trained oculist who must, perforce, also be a physician?

Consider also the helplessness of the optician in respect to dealing with the ocular muscles. Perhaps upon no portion of the eye has the

baneful influence of the optical meddler been more perniciously exerted than here. Prisms have been prescribed with absolute resklessness and in utter disregard of the relationship that must be preserved, if possible, between adduction and abduction. It is by no means uncommon to find a person wearing a prism, *base out* or *in, when a hyperphoria* of one or more degrees is causing the trouble of which he complains! The accepted theories of the physiological functions of the ocular muscles and the influence of innervation thereon, is to the bumptious optician as a sealed book. Only a few months ago, a lady of more than average intelligence brought to the writer's consulting rooms, a little girl, age 9, with this history: The child had recently recovered from an attack of diphtheria. Soon afterward it began to "have trouble with its eyes." Double vision and indistinctness of near objects were particularly complained of. Such a history, without an examination of the muscles, would have told the trained physician, whether oculist or not, that he had before him a case of paresis of some of the ocular muscles, due, probably, to diphtheretic poisoning. The lady displayed a vicious looking pair of spectacles which the rascal or idiot of a jeweller, yclept optician, had sold her for about twice their actual value, with the injunction *that she have the child wear them constantly!* They were + 5.50 D spheres! The only reason the child's eyes were not irretrievably ruined was doubtless because the sphericals fortunately caused her so much pain that she stubbornly refused to wear them. Absolute rest and non-use of the eyes, shaded glasses, eserine and galvanism for a few weeks, happily sufficed to cure this case. But was the action of the jeweller in meddling with something that he did not understand — knew that he did not understand — and which was no part of his legitimate business, any the less a crime because the child luckily escaped blindness? Was this not a case where a mechanic had been practicing medicine and doing it, of course, illegally? Ought not penitentiary doors to yawn for such a man?

The writer has seen within the last eighteen months three cases of acute glaucoma which he believes were greatly aggravated if not wholly caused by wearing improper glasses which had, in each instance, been prescribed by a cross-roads jeweller. Two of these cases were astigmatic (hyperopic) above 1.00 D, and yet both, at the time of observation, were wearing *strong concave sphericals!* Doubtless spasm of the ciliary muscle, uninfluenced by a mydriatic, caused the victims to accept, and the jeweller to give, concave spheres when convex cylinders were required. The third case, with extremely weak adduction, had been overcorrected 1.25 D with a convex sphere, whereas only the horizontal meridian called for any interference whatever. In each case sight was

practically and permanently lost. Is there not abundant warrant for the belief that had these unfortunate people consulted an ophthalmologist—a man capable of exploring the eye-ground and differentiating between a normal and a pathological excavation of the disc — sight might, by treatment or operation, have been, in some measure, at least, preserved? Nor are these isolated cases by any means. They are, as most oculists can attest, matters of daily repetition all over the country. The law protects people's teeth by very properly requiring graduation and registration by practitioners of dentistry; and yet the dentist's error can be tolerably well cured by a set of artificial teeth. But what can cure the wrong wrought to the eye by the jeweller-optician? It is true that for the purpose of bettering optical appearances we have artificial eyes; but, alas, "they see not."

In the State of Pennsylvania it is illegal for a person to practice veterinary medicine or surgery without previous registration, which involves graduation from a college of veterinary surgery, or examination before a State board. But while thus protecting the life and limb of the dumb brute, this proud and progressive Commonwealth has no protection whatever to offer to the eyes of its citizens! Anybody is at liberty to tinker with a person's eyes, although prohibited by law from filling his teeth or treating a spavin or ringbone on his horse!

As if self-impressed with a sense of their incompetency, a new legend has recently appeared as an addenda to their business cards and in the newspaper announcements of these so-called opticians. The evident design of the legend is to indoctrinate the innocent and confiding public with a deeper realization of their optical importance and so to "tighten their grip," as it were. The legend runs something in this wise, "John Smith, *Graduated Optician.*" Graduated from *where* and *what?* Does it mean that John Smith has studied and mastered that branch of physical science which treats of the nature and properties of light, and the laws by which it is modified through the medium of opaque and transparent bodies, including the phenomena of vision? Not at all. Does it mean that the aforesaid Smith has studied, mastered, and applied the principles of grinding so that he is able to make a lens from a sphere or cylinder, or that he is able, *practically*, to grind cross-cylinders with mathematical precision when they are of erratic angularity? Not at all. Usually the announcement means that this John Smith has visited one of the several wholesale optical house in one of the larger cities and spent a few weeks (the curriculum is ordinarily completed in two weeks) at such an establishment, receiving instructions in the *manual* procedure of manipulating lenses in front of people's eyes. Occasionally they are shown

ophthalmoscopes, skiascopes, photometers, ophthalmometers and other optical instruments, proficiency in the use of any of which involves the labor of weeks and months. Upon the completion of this curriculum, the "graduate" emerges with his diploma (?) and a confused idea of the uses of the various instruments shown him at the store and which he is informed constitute a part of an oculist's armamentarium. He turns his face homeward, flushed with pride at the magnitude of his accomplishments, with a case of trial lenses and a test card, prepared to advertise to the world his capabilities, which include the use of the instruments enumerated above.

This is no over-colored picture, let it be understood. The writer has been a witness to such procedure again and again, and the description is accurate in every detail. The wholesale house that lends itself to this dishonest business, does so, presumably, from motives of commercial gain. Every "graduate," if successful in his practice (?) means another customer for its optical goods. And thus it becomes a process of "you tickle me and I will tickle you." I once saw one of these "graduates," fresh from his *Alma Mater*, making a public exhibition of his abilities as an optical instrumentalist. He was pretending to use the Javal Ophthalmometer. In attempting to manipulate it, he had swapped places with his subject, and had seated the patient at the end of the instrument designed for the observer! Thus the examination (?) proceeded, doubtless to the *present* satisfaction of both operator and victim.

What would the general practitioner of medicine say if a mechanic or business man who, after five or six weeks of study at a hospital competent to teach the art of massage, were to advertise himself to the public as a "Graduated Masseur" and announce his readiness to make examinations and treat diseases of the nervous system, beginning, presumably, with spinal hyperæmia and ending with tabes dorsalis or poliomyelitis? "Outrageous" would doubtless be the word that would instantly leap to his justly indignant lips. But let him be assured that the parallelism between the hypothetical "Graduated Masseur" and the actual "Graduated Optician," is absolutely complete. Neurologists are using massage as an *adjunct to other treatment*, very liberally nowadays in a great variety of disorders, both functional and structural. So, too, oculists are using lenses in a vast variety of ocular disturbances. Frequently they are prescribed as an *adjunct to other treatment*, being given merely to rest the eyes for a brief time during the existence or subsidence of an internal irritation or inflammation; or, they may be prescribed to correct, for a time, some slight optical abnormality which does not demand permanent treatment by glasses. If it is "outrageous" for a masseur,

trained to do one specific act and that only under the direction and strict surveillance of a physician, to presume to examine and treat diseases affecting the spinal cord, why is it not equally audacious for an optician, merely because his business is legitimately that of supplying lenses upon orders, to presume to treat ocular irregularities? The eye is susceptible to as many and as complicated disorders as is the nervous system, and they are quite as difficult of recognition and treatment.

A person suffers from pain or weakness in the back which is *thought* to be rheumatism but *may* be the beginning of a grave lesion of the cord. Whom is it safer to consult about it,—a masseur or a physician! A person's eyes are painful and sight is disturbed and it is *thought* that glasses may be required or need changing, but it *may* be the initial stage of glaucoma. Whom is it safer to consult,—an optician or an experienced oculist?

(*To be concluded in November.*)

* * *

Selections.

Mercurials in Ophthalmic Practice.

Dabney, in the *American Practitioner and News* for March 9, 1895, states that the application of mercurials may be divided into, first, the local, and second, the internal. Locally, mercurials are used both as remedial agents in disease and as antiseptic agents in operations and wounds. Perhaps their curative power depends also on their action as germacides, but this cannot be proved in many cases. Among the most common diseases for which a preparation of mercury is indicated is inflammation at the margin of the lids, the so-called blepharitis marginalis. The application of a salve of yellow oxide of mercury, of a strength of from one to four grains to the drachm of vaseline, is an almost routine treatment. Yet not all forms of the disease are equally benefitted. In the writer's experience it is the variety with little pustules, or scabs at the root of the lashes, in which the remedy is most efficient. In such cases, after carefully cleansing the lid, it is well to touch the edge with peroxide of hydrogen before applying the salve. The application should be made morning and night. In the dry, scaly form other remedies, notably the oil of cade, are often most efficient. In all cases we must of course search for the cause of the inflammation in eye strain from uncorrected errors of refraction or muscular anomaly, nasal disease or bad hygiene.

In purulent conjunctivitis, whether of the infant or adult, a solution of bichloride of mercury is a valuable addition to the constant cleansing, hot or cold applications, and nitrate of silver upon which we chiefly depend. In the first stage of gonorrhœal ophthalmia very hot solutions of the bichloride, of a strength of 1 to 6000 or 8000, are of great service. In this connection it is well to note the statement made in the recently issued "Hand-book of Local Therapeutics," that "a 1 to 10,000 hot solution is more active in destroying pus-formation, or for cleansing purposes, than a 1 to 2000 solution used cold." Yet we often find the iced bichloride solution most valuable in the first stage of gonorrhœal ophthalmia. Later when there is a profuse secretion, the bichloride should be used to the conjunctiva either with a fountain syringe, hand syringe, or medicine dropper. Cases of ophthalmia neonatorum which progress very slowly under the frequent cleansing with boracic acid and daily application of nitrate of silver improve very rapidly when a solution of bichloride two or three times daily is added.

In dacryocystitis, whether acute or chronic, syringing the tear-sac and duct with a solution of 1 to 5000 is valuable.

In ulcus serpens or other corneal ulcers with foul base and tendencey to spread, hot bichloride solutions laid on the eye one hour in every three, or even for a longer time are among our best therapeutic resources. Tonics, hygiene, and diet are of great importance.

In phlyctenular conjunctivitis two forms of mercurials are used. In small phlyctenules grooped around the corneal border, and where the cornea itself is involved, the yellow oxide of mercury salve in the strength above mentioned is an excellent local application. It is often best used in conjunction with eserine; especially in the so-called miliary phlyctenules of the conjunctiva excellent results follow the dusting of a little calomel upon them. Swanzy, in his last edition, states that yellow oxide salve, of strength thirty grains to the ounce, is the best application to this form of the disease, and either calomel or salve should be used in the multiple variety. The calomel is changed into bichloride, but, just how it acts is uncertain. It is not merely mechanical, as inert powders have been substituted for it without effect. We are cautioned against the local use of calomel in the eye when a preparation of iodine is being administered internally; an iodide of mercury is said to be formed. In torpid corneal ulcers and superficial opacities of the cornea, calomel or the yellow oxide salve is often useful. In trachoma much has been claimed for a strong solution of bichloride,—250 painted over the everted lids. The weaker solutions are certainly of value when

there is much secretion, and as applications after surgical treatment, as with Knapp's roller forceps.

Certain Continental oculists, especially the French, have recently written much and with great enthusiasm on the subject of subconjunctival injections of mercuric chloride. The writer has had no experience with it.

Bull, in a recent number of the *New York Medical Journal*, after a review of the recent literature and a summary of forty-eight cases in which he has tried this treatment, concludes that the pain and re-action after the injections are generally severe, and that the only cases in which he seemed to obtain benefit were scleritis and acute irido-choroiditis, non-syphilitic; and finally, that this method of treatment is still on trial and should not be promiscuously employed.

In wounds of the eye or its appendages, cold solutions of the bichloride laid frequently or kept constantly on the eye, will do much towards lessening the danger of infection, and subduing incipient inflammation. A solution of 1 to 4000 is sufficient for the purpose.

In operations on the eyeball the bichloride is of great service, as it is in operations elsewhere. But there are two limitations to its application: first, solutions not stronger than 1 to 3000 or 4000 are likely to irritate the eye; and second, some opacity of the cornea has been observed to follow the use of bichloride in operations where the eyeball is opened, as in cataract and iridectomy. Most surgeons have a 1 to 4000 solution used on the face and lids, and a weaker solution, say 1 to 8000, in the conjunctival sac, and a solution of boric acid for irrigating the eye during and after operation.

Second, the internal use of bichloride of mercury in ophthalmic practice may be considered, first, in cases where syphilis is certain or probable; and, second, in cases where no evidences of syphilis exist. To quote Noyes: "In doubtful cases we give mixed treatment, as in whist a player in doubt leads trumps." In cases where syphilis is not believed to exist, the indications for mercurials are three: (1) as a cathartic for its derivative and absorbant action, (2) to promote absorption, (3) as a tonic. Perhaps to these should be added its power as a germacide when administered internally.

1. A mercurial purgative is often valuable in the acute stage of gonorrhœal ophthalmia, of iritis, cyclitis, and other inflammations of the eyeball. Here a good dose of calomel is the best form to use.

2. To promote absorption of inflammatory exudate, even non-syphilitic, mercury is often administered. Recent text-books agree as to its value, but differ somewhat as to the mode of using it in these cases. Norris,

for instance, recommends, whether syphilitic or not, bringing the case sufficiently under the influence of mercury as to cause slight sponginess of the gums; while Berry maintains that the use of mercury should be continued a considerable time, and that ptyalism, even in a slight degree, is an accident to be avoided. In central choroido-retinitis, where a recent exudate in the region of the macula lutea has greatly impaired sight and threatens irreparable injury to vision, the writer uses mercury by inunction, and pushes it until the gums are touched. Of course other agents are often called for, such as leeching and absolute rest in a dark room. It is remarkable how rapid and complete a recover such cases may make when prompt treatment is instituted. Several in which vision was reduced to mere perception of light, the patients being unable to count fingers close to them, have recovered perfect sight. How far this result is attributable to mercury, and how far to other remedies and to nature, it is impossible to say.

In sympathetic ophthalmia, in cyclitis with extensive exudation into the vitreous, and in iritis where large synechiæ resist atropine, hot applications, and leeching, the somewhat vigorous use of mercury is indicated. In papillitis it is also worthy of trial. In all these cases it is the writer's custom to use the inunction treatment preferably with the Fraser capsules of mercury. If benefit does not follow by the time the gums are slightly touched, it is well to desist from the use of the drug. Tonics are often indicated at the same time.

In the more chronic affections, such as choroiditis disseminata, opacities of the vitreous, choroido-retinitis, sclero-keratitis, mercury is often prescribed, but naturally with far less promise of good. In these cases it is well to give moderate doses of the bichloride combined with small doses of iodide of potassium.

As a tonic, small doses of the bichloride of mercury are probably valuable in long-standing corneal disease; in choroiditis, in recurring phlyctenular ophthalmia, and in other affections associated with depraved nutrition. In many of these diseases we are no doubt dealing with syphilis, either acquired or inherited; but the point emphasized is that mercury may be of great value, even in non-syphilitic cases.

Finally, a few words as to mercury in syphilitic diseases of the eye. Here, as elsewhere, we are taught to trust to mercury in the early stages and iodide of potassium in the latter. The writer usually orders the mixed treatment in all cases, but determines the dose of the drugs respectively somewhat by the stage of the disease. It is well known that a large proportion of cases of iritis, choroiditis, and other affections of the eye, as well as of the optic nerve, are syphilitic.

The Refractionist.

A Journal of Practical Ophthalmology.

FRANCIS F. WHITTIER, M. D., Editor.
74 Boylston Street, Boston.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.
Address all communications to the Editor.

"Refract."

We have recently had a pleasant correspondence with Dr. Casey A. Wood of Chicago, in reference to the verb "refract," as used in a previous issue in the expression "physicians who refract."

Dr. Wood, in the *Journal of the American Medical Association* of March 9th, drew attention to the (in his opinion) improper and unauthorized use in medical literature of certain words and phrases. Among those happened to be the verb "refract," when used in the active sense with a person as the object. Our attention had not been called to the doctor's excellent article previous to the use of the word in The Refractionist. While Dr. Wood admits that there may be a demand for such a verb, he suggests that any new word should conform to the purpose of the original meaning, and cites "cycloplegic" as derived from "cycloplegia," and this directly from the Greek; also, other words of similar derivation lately coined.

The object of the verb "refract," as we have used it, is not a "person," but "rays of light." The deformities or defects of the human eye are so closely associated with diseases of the eye that some word seems to be required to express the idea of dealing with the former, when this constitutes nine-tenths of a physician's work, whose practice is limited to the eye. As far as we know, the Greeks or Latins (unfortunately, perhaps) were not conversant enough with the correction of defects in vision (if they had any) to leave us a word nearer than *frangere*, meaning to bend or break, the supine stem of which, "fract," united with the prefix "re," gives us the word "refract," to bend back. The physician who corrects defective vision does so by "refract-

ing," bending back, rays of light, by means of different forms of lenses, so as to form correct images on the retina. In other words, he "refracts" rays of light so as to give relief to his patient. If there is a better word and a more direct derivative to express the meaning, we shall be only too glad to accept it. Following the verb "refract," we have the participial noun "refracting," as in the sentence "He does refracting," and the term "refractor," one who refracts, following the analogy of "actor," one who acts, and similar words; or "refractionist," one who refracts, following the analogy of "extortionist," one who extorts, and similar words.

* * *

School Officers. In the November number will appear Dr. Southard's article on "School Children's Eyes" —a plea for the examination of every child's eyes, when commencing to attend school, which was read at the forty-fifth annual meeting of the American Medical Association and published in the Journal of the association. To bring about the proper care of the eyes of children in our schools the officers in charge and teachers must first be impressed with the importance of such a procedure. When once an intelligent person's attention is called to the need of some supervision of the eyes of the pupils in our schools by qualified *physicians* and the work is once inaugurated, it will be productive of much good.

For this purpose the October and November numbers of The Refractionist, containing the valuable articles of Dr. Pilgrim and Dr. Southard, will be sent to a large number of school officers and teachers, and we shall attempt to render such assistance to any such persons by arranging for some physician conversant with refraction work to visit any city, town or tiers of towns, for the examination of pupils and giving such information as may be desired to teachers at Institutes or other meetings. For this purpose correspondence is solicited from school officers or teachers.

* * *

Retinoscopy. We shall soon commence a series of articles on "Practical Retinoscopy," by Dr. C. W. Hawley of Chicago.

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. NOVEMBER, 1895. No. 8.

SHALL OPTICIANS ATTEMPT TO FIT GLASSES?

BY MAURICE F. PILGRIM, A. B., M. D., CARBONDALE PA., OPHTHALMOLOGIST TO THE CARBONDALE EMERGENCY HOSPITAL.

[*Continued from October number.*]

Consideration is now invited to the second objection to the prescribing of glasses by the optician, *i. e.*,

(*b*) Lack of clinical experience.

Conceding for the purpose of this discussion what is, of course, not true, that the optician (who, not being a physician, is ignorant respecting ocular disturbances of reflex origin, and who has not been trained to associate cause and effect in his calculations and determinations,) were possessed of the theoretical knowledge necessary to enable him to properly fit glasses, he still lacks a material qualifying element. Theory, unaccompanied by clinical experience and application, is as valueless as it is dangerous. Great surgeons and physicians are not made by studying books or listening to lectures, invaluable as are these as a *means*. It is in the operating-rooms and wards of the hospital that the surgeon acquires his practical ability and deftness as an operator, and the physician his acuteness of hearing and touch as well as his skill in diagnosis. Equally is it true in reference to the ophthalmologist. The larger proportion of men practicing ophthalmology today were previously and for a variable number of years, general practitioners of medicine. Relinquishing general practice after having, perhaps, devoted much of their leisure for a long time to a theoretical study of the eye, from six months to two years are usually spent in eye infirmaries and hospitals. Here every variety of ocular disturbance, from mere defects in corneal curvature and other errors of refraction, up through the various grades of disease to the dreaded glioma of the retina or phthisis bulbi, are seen, examined, studied, and treated. One month of such practical work is worth infinitely more as a preparation to dealing understandingly with ocular abnormalities (including errors of refraction) than years of mere book study. Oculists are unanimous, it is believed, in holding that,

without such clinical experience, a person is not properly equipped to satisfactorily practice ophthalmology, no matter how eminent may be his qualifications as a physician in other departments of medicine. The optician undertakes to treat eyes — for fitting is treating — without the advantage of such clinical observation and experience. If a physician, after years of observation of various human maladies, is not deemed competent to practice ophthalmology without first subjecting himself to a preliminary period of ocular training at the clinics, how can it be reasonably insisted that this requirement may with entire propriety be waived in case of a person who is not even a physician, but merely a mechanic,— an optician?

Having waived, for the time being, therefore, the first objection (*a*), "lack of theoretical knowledge and training"— the second objection would, of itself, prove fatal to the optician's pretensions. Not being a graduate of medicine, no respectable eye clinic would be open to him. Eye infirmaries and hospitals usually restrict their clinical advantages to medical graduates, not even admitting thereto, undergraduates. The optician being neither, could not, obviously, enjoy these absolutely essential advantages.

Still another objection remains to be considered, which, also, like the preceding reason, is in itself conclusive against the optician's pretensions, *i. e.*,

(*c*) Lacking diploma and registration as a doctor of medicine, he is legally debarred from practicing.

If the two previously noticed objections did not exist, or could be cured, viz.:

(*a*) Lack of the necessary theoretical medical knowledge and training; and

(*b*) Lack of the necessary clinical experience,

the optician would still have no legal right to practice medicine without possessing a diploma from a legally chartered and duly recognized college of medicine, registered according to the laws of the Commonwealth. An attempt to practice would render him liable to indictment and prosecution, and it would be no defense at bar to offer proof either of his possession of the requisite theoretical knowledge or of his having had the approved amount of clinical experience, assuming, for the purpose of this discussion, that it were possible that he might have them. Because a person *thinks* himself competent to practice medicine, furnishes no legal justification or defense for his presuming to do so. The statute regulating such matters is both specific and mandatory. It says *who* shall practice medicine, and makes no provision for those *who think themselves qualified.*

Doubtless many of these men, although actuated thereto primarily by a strongly developed commercial instinct—a desire for the profits that accrue from the sale of glasses—*believe* themselves competent to fit glasses "as well as the oculists." The writer once loaned to an acquaintance—a bright young man and a skilled watchmaker and jeweller who had been in the habit of attempting to fit glasses—a copy of Dr. Gower's very able and exhaustive work on "Medical Ophthalmoscopy." As the young gentleman followed the celebrated English physician through the hundreds of pages of that work devoted to the enumeration and consideration of the various ocular affections having their origin or initial lesion in other parts of the body, but which may and frequently do affect the eye through reflex influence, he became appalled at the shoreless sea of knowledge that it discovered to him. So greatly was he impressed by the insight which the book gave him into the subject that, although continuing his avocation as a jeweller, he never fitted another pair of glasses! Unfortunately knowledge cannot be relied upon to exert in all cases such a chastening and subduing influence.

Druggists have been punished for prescribing over their counters, but opticians who are quite as guilty of a breach of the law and whose practices frequently are more far-reaching in their consequences and entail greater harm, have thus far escaped. But, it may be asked, are these vending jewellers actually practicing medicine? Let us see. A person goes into the store of a druggist and says, "I am suffering from what I think is heart trouble,—I have shortness of breath," etc. The druggist may or may not listen to the man's heart, but prescribes digitalis, nitroglycerine, strychnine or any other remedy he *thinks* the case demands. The patient's condition may or may not improve; that point is not material; that druggist has been practicing medicine illegally and may be punished for having done so. No lawyer will question that proposition. The next person goes not to the druggist but to the jeweller, and says, "I have frequent headaches; my head feels full and I am dizzy; my eyes smart. I believe my trouble is all due to my eyes." The jeweller places lenses over his eyes and finally finds a pair with which the man can *apparently* see as well as without, or, perhaps, better, and sells them to him! Is he not practicing medicine illegally equally with the prescribing druggist? If not, why not? The druggist *may* be as capable as the physician to listen to the patient's heart and order a dose of nitroglycerine, but he lacks the training, the clinical knowledge and the legal right to prescribe medicines. Why does not this apply with equal pertinency to the optician? The druggist has not been trained to judge of the possible connection between shortness of breath and abnormal heart

sounds and may not prescribe the proper remedy. His legitimate business is solely to compound and dispense medicines under the physician's written orders. Likewise is it the sole legitimate business of the optician to grind or supply lenses precisely in accordance with the formulæ of the oculist. It is neither reasonable nor comprehensible to suppose that the law contemplated giving to the optician a right in this regard which is withheld from the druggist. Like the druggist, he has not been taught the anatomy, physiology, pathology or the law of the interdependence of the visceræ and organs of the human body which, *on the other hand, has* been a part of the physician's and oculist's training.

The refraction work of the oculist requires not alone a knowledge of optics, but also of general medicine. Otherwise he would not be able to establish proper relationship between cause and effect and assign to each its just weight in his final determinations. The oculist's work does not consist merely or *essentially* in placing a lot of lenses successively before a person's eyes and then in prescribing the one that the *patient says* gives him the best or clearest vision. He may have latent hyperopia and by a habit of squinting, have rendered himself at the time of the *alleged* examination, artificially myopic. Thus he might select, as has often been done, a concave sphere as the proper glass because it seemed at the time to give the clearest vision. It would be a sorry sort of an oculist, indeed, who would dare thus to prescribe glasses. It is the province as it is the *duty* of the oculist to know rather than the patient, what lenses ought to be worn. This fact the skiascope in capable hands will almost never fail to disclose. It repeatedly occurs that the lens selected by the patient as being the most comfortable and affording the best vision at the time of the examination, is precisely the improper one, to wear which would entail the direst ocular disaster. This is pre-eminently true of cases of latent hyperopic astigmatism where the *degree* of the error, in order to be corrected, must be literally "dug out," as it were. Oculists accustomed to refract by the aid of a cycloplegiac, know how often this is true and how utterly misleading and unreliable *subjective* tests oftentimes are.

Nor is it always advisable to fully correct an error when it is discovered, whereas others may demand, occasionally and for a brief time, a slight over-correction. The relationship between adduction and abduction enters as an important factor in determining this point. So, too, does the nervous organism of the patient, his habits, his temperament, etc., etc.,—all of which, obviously, demand the judgment of a physician. The patient's *totality* and not alone his eyes, must be brought in review if a satisfactory refraction is hoped for. Perhaps at

no point in his refraction work does the skill of an oculist count for so much as when after having completed his examination objectively, he seats himself to consider and write his prescription. As the faces of no two people are ever precisely alike in feature and outline, so rarely do we find exactly similar ocular conditions that admit of the same treatment. The contra-indications in prescribing lenses have been found by the writer to fully equal those encountered in treating affections of other parts of the body. Therefore, no hard and fast rules can be formulated in respect to our final determinations in refraction work. Every case must stand alone and be decided upon its individual merits. Its proper treatment demands that judgment and nicety of determination which is born only of comprehensive and thorough theoretical knowledge and is ripened and enriched by experience. Refraction, let it be understood, is more than an art,—more than a mere trick of trade; it is a science which in its practical application draws largely upon one's knowledge not alone of optics but also of general medicine, and demands an understanding of human idiosyncrasies as well.

An oculist's duty is far from being fully discharged when he gives his patient an order for glasses. Nearly 60 per cent of the writer's cases during the year 1894, required treatment in one form or another and for a variable length of time, in addition to glasses, in order to make their eyes comfortable, leaving out of view the element of future safety. What would the optician or the jeweller have done in this 60 per cent of cases? What could they have done intelligently or legally?

Before concluding this paper, it may be well to anticipate, briefly, some of the points that might be urged in defense of the refracting optician.

I. "Conceding all that you affirm respecting other ocular conditions, may not an optician still be competent and permitted to prescribe for 'old sight' (presbyopia)," is a question that might, perhaps, be asked. While not unmindful that the prevalent custom has been for people when they discovered themselves growing presbyopic—the near point having markedly receded—to go to a store and buy a pair of glasses that sufficed to bring their work up to a comfortable working or reading distance, it need only be mentioned to be condemned. It might be assumed, however, that it would be an improvement upon the old and condemnatory custom were such folks to consult an optician (which could be done without the expense of an examination fee) and have him select their glasses. The advantage from such a procedure, however, would be more fanciful than real. The optician being obliged to depend upon the patients' statements as to their needs, could add noth-

ing to their own judgment in the selection of a glass. The optician's knowledge could at best only equal that of the patient's, whereas it is much more likely to be inferior to it.

Besides, presbyopia is far from being the inconsequential epoch in the life of an eye that is popularly supposed. The writer's case-book for the last three years shows that in about 55 per cent of all his presbyopic patients, an examination of the eye-ground disclosed more or less retinal or choroidal disturbance, ranging from a slight irritation up through the intermediate grades to positive and serious inflammation. Such cases were subjected to treatment and instructions given as to the care and use of the eyes. Such service was deemed as essential as the giving of correcting lenses. Indeed, in not a few cases it was found advisable to withhold glasses entirely for a time and enjoin absolute non-use of the eyes, coupled with treatment appropriate to the diseased condition. The optician does not and cannot determine whether his presbyopic patient simply requires a pair of spheres, or is hovering over the brink of a choroiditis or some other equally serious ocular peril. Such a condition is far from being uncommon in presbyopia, especially when the presbyope has deferred, as is too often done, seeking the assistance of glasses until near work becomes an absolute impossibility without them. Under such circumstances it will almost invariably be found that upon a natural presbyopia has been engrafted more or less eye-strain or internal irritation. The beginning of many cases of life-long and troublesome asthenopia and not a few cataracts, date from this pivotal, and, therefore, *critical* period.

A glass should never be given a presbyope until the existence of internal trouble has been excluded by a careful ophthalmoscopic examination, *and the total refraction of eye measured.* The last-named procedure is of the highest importance because there may have existed for a long time a low grade of astigmatism that only became troublesome at the presbyopic period, which is the beginning of a gradual decline in the virility of the eye. If astigmatism does eixst, even though not yet troublesome, the writer believes that its correction is imperatively demanded and should be added to the reading glass. Failure to do this is believed to be responsible for very many unsatisfactory glasses that are prescribed for presbyopia.

In view of the foregoing, is it not obvious that the non-professional man — the optician — is not better qualified to deal with presbyopic cases than with other ocular disturbances?

II. Another defense which might be urged in the optician's favor, is that people of limited means — the worthy poor — cannot afford to pay the fees of an oculist. This point loses its force when it is remembered

that every eye infirmary and hospital offers a free clinic to those whose eyes require attention and who are too poor to pay for the service. There they may have their eyes refracted or treated by men of experience, without money and without price. In one institution alone in the city of New York—the Manhattan Eye and Ear Hospital—11,201 patients were treated gratuitously in the year 1894, and of this number, 34.29 per cent required and had glasses fitted. Evidently the poor would still be abundantly cared for even though every refracting optician should pass into liquidation.

III. Still another claim might be made in favor of the refracting jeweller, which can, perhaps, be best put in an interrogatory form, thus: "What is to become of the rural population, living remote from large cities, and so out of reach of the oculist?" Many of these people, it may be contended, cannot afford to visit the larger cities for the purpose of having their eyes attended to. Such a question might very appropriately be answered by propounding a counter query: "Would that be a valid reason for employing a quack or an unskilled person if one were seriously ill?" People urging such a reason might very properly justify their conduct in consulting a druggist rather than a physician, on the ground that to do so were cheaper. Persons who would reason thus, have not yet learned to appreciate or adequately value their health or their eye-sight, and it is the duty of the community to protect them against themselves. There is, however, a remedy for this difficulty that would be both efficient and easy of application. If the State, through the agency of its laws, would put an end to the now prevalent optical jugglery as it has to the vocation of the peripatetic medical quack, it would be found that the supply of competent oculists in the smaller cities and towns would not long remain insufficient. Under present conditions, however, scant encouragement is offered to a capable oculist to locate in a small town because of the existence of the ubiquitous jeweller, who flaunts his second-grade wares (for which he charges first-grade prices) in one's face from almost every street corner. Self-respecting and competent oculists cannot be expected to locate in places where they must become competitors with such pests. Therefore, oculists are to be found chiefly in the larger cities where the evils of refracting as done by *bona fide* opticians are somewhat more tolerable than the crimes perpetrated by the loud-mouthed country jeweller who is enormously inflated with a mixture of ignorance, arrogance, and impudence. Once stamp out the nuisance and iniquity of optical jingoism that is now running rampant, and there will not be a lack of ophthalmological service in any quarter where it is needed or would be appreciated.

In conclusion, it is the writer's unflinching belief that there already exists in most of the States sufficient statutory enactments to put an end to the abuses complained of *if only they were vigorously enforced.* Any law which punishes a druggist for counter prescribing, or the sojourning quack for practicing, ought, by any fair construction, to be adequate to reach and punish the refracting optician. At all events, is it not our solemn and bounden duty to test the efficacy of such laws, and if found inefficient, demand further and more effective legislation? Let the Legislatures of the several States be given clearly and pointedly to understand that such legislation is not invoked for our selfish benefit or protection. Oculists, as a class, are doing well enough now, and do not need the fostering assistance or protection of the law. *But the public need it,* and in its name we should make our demand. And in this effort have we not a right to expect our professional colleagues—the general practitioners—to stand shoulder to shoulder with us as we in similar movements have stood with them? If as the guardians of the health and lives of the community they conceived it to be their duty to restrain, through the mandate of the law, the druggist and the quack from maltreating the public, can they afford to remain indifferent or inactive in a contest which has for its ultimate object the protection and conservation of the sight of their patients?

And, finally, if the dumb animals and the teeth of the community are worthy of protection against the onslaughts of incompetency; if druggists and quacks are restrained from tampering with other parts of the human body, is it fair to discriminate against one only of its members by withholding from it every semblance of protection? Nay, more, is it not unreasonable as well as unjust to leave the eye, in structure and function perhaps the most delicate organ of the body, a defenseless prey to the assaults of ignorance and the rapacity of human greed?

No. 15 North Main St.

ERRATA.

In the October number, on page 101, 14th line from top of page, "protographs" should read photographs; and on page 105, 4th line from bottom of page, "house" should read houses.

Selections.

School Children's Eyes—A Plea for Examination of Every Child's Eyes When Commencing to Attend School.

Looking over the annual report of the public schools of the city of San Francisco for the year 1893, I find that there was an average daily attendance of 31,002 pupils between the ages of 5 and 17. Of this number 69 and sixty-three hundredths per cent were in the primary grades. This includes all children between 5 and 10 years of age. Twenty-six and six hundredths per cent were pupils in the grammar grades, while but 4 and thirty-one hundredths per cent were high school pupils. These pupils between, say, the ages of 10 and 17 were divided between the grammar grade and high school. I wish to emphasize the point that, though this does not state the total enrollment of pupils, it does very correctly give the daily attendance throughout the year. An analysis of these figures will give us some very important results. In the first place, you will observe that from the primary grades over one-half, or 50 and forty-three hundredths per cent fail to enter the grammar grades. These children at this time are about ten years of age. At the close of the grammar grades, 71 and sixty-eight hundredths per cent, or more than three-fourths, fail to enter the high school.

Finally, to show more vividly the enormous decrease of school attendance between the tenth and seventeenth years, we learn that there is a total loss of 96 per cent as between the primary school attendance and the high school attendance. Let us see if we can discover the cause for such a tremendous variation in attendance between the three departments of our public schools. We shall find, I think, that not one only but many circumstances conspire to bring about these results. The average person will be very likely to say that removals, deaths, sickness and discouragement ought to be a sufficient explanation. I am sure that a more thoughtful examination into the causes will convince us that not only the above mentioned, but other reasons exist for such a condition of affairs. To my mind this fact is a cause for greater surprise and alarm than that but 4 per cent of our primary pupils reach the high school, insignificant as is that number. At the age when pupils enter

high school a very large number are withdrawn to become wage-earners; they must assist in providing for the family. A very large percentage of the parents of these pupils think that completion of the grammar grade is all that their children need to fit them for all ordinary vocations. But this can not be the case at ten years of age, for the percentage of permanent bread winners of 10 or 12 years of age must be very small in this State.

We find on examination — that is, by questioning teachers, superintendents and those who are daily brought into contact with children,— that the number dropping out because of their inability to keep up in their studies must be very large. It is possible that as we examine this particular cause for loss more carefully, we may discover the very material we are after by which our proposition may be maintained. I have held for some time in my arguments with educators, that if curves showing the mental capacity of a thousand children of the same age could be drawn, they would show but a very slight variation one side or the other from a given mean. I believe that we shall find that the brain capacity of our children can be measured with as good results as we have obtained in other branches of anthropometry, a study which has been brought to a very high degree of accuracy. For example, Professor Bowditch of Harvard University, Professor Gihon of Annapolis, and Professor Hitchcock of Amherst, have together measured some 40,000 persons between the ages of 5 and 25; the design being to show the rate of growth of the body for the different ages. From these measurements a certain mean standard of physical development, height, weight, chest measurement, length of body, sitting and standing, etc., to which the great majority nearly attain has been found. The deviation above or below this mean is found to be about the same.

That there is a tacitly recognized uniformity in brain capacity, powers of comprehension and general intelligence among children of the same age, is proved by the fact that school books have been prepared, hours of study, and the studies themselves arranged to meet this. We may question the wisdom of making text-books on such a rigid plan; we can not deny the facts. It follows, therefore, very clearly it seems to me, that very nearly equal results should be attained by the great majority of pupils. If this is not true then there can be no law governing our intellectual powers. If, then, we find in the same grades at school a very wide departure from the standard, we must conclude either that the general standard is too high or a very large percentage of our children have some disability. Why should so many children become discouraged? Their work is not particularly difficult, their hours are comparatively

short, and in the primary grades they are not expected to study at home. Ill health is an important factor; thousands of children are already invalids before going to school; inherited weak constitutions; impoverishment of bodies from deficient or unwholesome food, bad hygienic surroundings at home, all unite to handicap such children in school work. The stooping forms, eyes bent close to the desk before them; the shuffling walk; the notched teeth; thin faces and other physical defects are to be seen every day and in every primary school. If we examine this class of children we find that they have in nearly every case marked deficiency in visual acuteness. We cease to wonder that such pupils can not compete in the struggle for an education.

There is again a large percentage who fall out of the ranks from among the apparently healthiest and brightest children. For a term or two they may have no trouble, but later on they drop behind, when they in turn become discouraged. We are able to positively state that they have no impoverished bodies, that they have always been well and have never complained before going to school. As they fall behind their classmates they are called mischievous, stupid, and other epithets of like character are bestowed upon them. Many of these children come home every afternoon complaining of headache, or if they have no headache they complain of feeling tired; they get listless, and hang about the house. They are being constantly corrected for not paying attention. In fact, one of the most frequent complaints from teachers is that such children never look upon the work before them more than a moment or two at a time. They are being constantly diverted to whatever is going on about them. It is needless to ask what is the outcome of this condition; the teachers get impatient and become constant fault-finders, the child gets discouraged, and the parents in many cases become dissatisfied and remove their children from school. It is among just such material as this that we find the evidences which confirm us in our theory that there can be but one way to treat this whole subject. We find that the very largest proportion of these children have errors of refraction or some disturbance of the visual organ. We find also on looking into the matter more closely, that the school environment is not of the best, school-rooms are imperfectly lighted in most every case, the proportion between windows and floor space is less than the standard. Many rooms are so situated as regards light that they can not by any means get good direct light. But too often the best light in the school-rooms is a reflected light from some adjoining high building. Such a light is most injurious to the eyes and to the nervous system. Then there is the question of heat and ventilation,—serious questions, too. The proper seating of the pupils at their

desks, the character of the seats themselves are in too many cases the cause of permanent injury to the growing child. Poorly printed books, and poor paper have much to do with strain upon the eyes. Though much has been attempted to remedy some of the most evident of these defects, we cannot but feel that the rights of the child have not been considered when we let contracts for building school-houses. Politics govern our school system in most places to too great an extent. We spend money enough to get the very best results; it is, however, becoming evident that enormous sums are most unwisely spent. Each of these points just mentioned needs more discussion than can be given at this time. Given these imperfect surroundings, together with some defect of vision, and we have a combination which must sooner or later be detrimental to the child, physically or mentally. Is it any wonder that he has no concentration?

In pursuing this subject of our public schools a little further, we have to note that in the primary grades there was enrolled at the commencement of the year a number equal to thirty-two and thirty-five hundredths in excess of the number in regular attendance. They mostly dropped out during the first two or three weeks of school. Such a number of units thrown upon the community unable to read or write must become in time a serious burden upon it. I am most firmly convinced from personal observation that poor eyes must be a leading factor in causing this great loss. A law compelling a rigid examination of the eyes of every child when he begins to go to school would seem to be demanded. Let every child come to school bearing a certificate stating the exact condition of its eyes. By such means the teacher will be put in possession of facts which will be of inestimable use to him and to his pupils. A plan so simple ought to commend itself to every physician, to every educator and to every parent.

Having shown the intimate relationship existing between imperfect eyes and lack of power to apprehend, a long step forward has been taken. Statistics have been made of many thousands of school children in Europe and America, by a large number of competent observers during the past twenty years. An examination of these results most clearly shows that there is a most intimate connection between education and defective vision. It has been proved that myopia (that form of defect to which all eyes tend) exists in but one per cent of the primary scholars in country districts. This is due to obvious causes; country children go to school a less number of hours daily, or if they attend less is expected of them. They also attend a less number of weeks during the year and they read or study but little at home. An examination of the city

schools shows at a glance a different condition of affairs. Myopia is found in these schools in far greater proportion. As we ascend from grade to grade, from primary school to grammar school, from grammar school to high school, from high school to colleges and universities, up to the highest institutions of learning, myopia is found ever on the increase, until in the very highest schools in Germany over ninety per cent have been found myopic. In other words, it is now an accepted fact that myopia is a product of civilization,—one of the results of our modern methods of education. It is not our purpose to discuss these methods on this paper, simply to draw your attention to a fact now generally accepted.

Having shown that there is this relationship between myopia and education, it may be said, But this does not account for the first proposition, viz.: That such a vast percentage of pupils drop out of the ranks at the early age of ten years. At ten years of age myopia has been found even at its maximum to be only ten per cent. Myopia, then, can not alone be a sufficient cause for so great a loss at so early an age. This is very true, but myopia is not the only error of refraction causing disturbances. It has been very satisfactorily shown that all infants are born hyperopic. We may also assume that a very large percentage are born astigmatic; of these, probably seventy-five per cent have hyperopic astigmatism. From five to fifteen years the child's body is developing most rapidly. A greater amount of nutriment is now being taken in proportion to its weight than by adults. Tissue changes are taking place in a most rapid manner. Physiologists claim that during these years a large part of the twenty-four hours should be given to body building by means of sleep, food and exercise. The visceral organs, for example, may be altered by too great and too continuous compression. It needs no philosopher to tell us that we must expect more or less alteration in the shape of the eyeball from too great and too continuous use of the eye at the near point. If we admit that this may take place in the so-called normal or emmetropic eye, how much the more likely are changes liable to follow over use when the eye is in its undeveloped stage? We know that the ciliary muscle of the hyperopic or undeveloped eye, from its very nature must be in a constant state of activity during all the waking hours. At the far point as well as the near point the effort is being constantly made to force the rays to a focus upon the retina. This effort means strain, and the strain means disturbance of the nervous system. The effort to maintain visual acuteness by the expenditure of force upon the ciliary muscle is not the whole story. According to the degree of hyperopia there is a change in the angle "alpha," which means that the attempt to

maintain binocular vision must be attended with expenditure of force, and this often leads to strabismus. This proposition brings us to the point I am to make, viz.: That children's eyes are from their very construction just the sort of eyes which will cause the greatest discomfort from over-exertion. The two factors, the attempt to produce visual acuteness by forcing the ciliary muscle to powerful contractions, and the effort to maintain binocular vision by forcing the extra ocular muscles, is liable to produce varied and peculiar symptoms upon the nervous system. I assert, then, that those children having hyperopia and hyperopic astigmatism are the real sufferers. Their constantly nagged nervous apparatus tends to become wearied to the extent that they can not give close attention to the work before them. They must look up often to rest their wearied muscles. Therefore, to expect continuous application and good attention is most unreasonable. That such children may lose interest in their school work on account of the difficulties surrounding them we can readily understand. We could, did space permit, show that these imperfections may have a very marked effect in the development of the child's character.

In my examination of the eyes of the students of the University of California, for the past five years, I found that the percentage of refractive errors was sixty-eight per cent. Of this number only six per cent were myopic. In a detailed analysis of 1,300 errors of refraction I have shown that seventy-five per cent were hyperopic in some degree. I found in looking over the list of symptoms attending these cases that pain of eyes, headache, muscular spasms and nervous symptoms generally were confined to this class of cases. The myope but rarely complains of anything more than inability to see at a distance.

It is not to be denied that myopia is greatly to be dreaded; since it can not be stayed in its progress in many cases, even though corrected with glasses. We are willing to believe that it is the end toward which a vast proportion of eyes tend when over-worked. We claim, however, that our sympathies are rather to be directed to the youthful hyperope. Could we but examine every case during the first few years, we would not be sending to our universities young men and women with eyes just ready to break down. The remedy is examination and constant watchfulness. We must bear in mind that the tremendous waste unnecessarily taking place through the effort to work under the disadvantages of a refractive error is not easily measured. Individual suffering, and loss of power to work, may cause great material loss. From this cause the community has to be taxed to support asylums; from this cause many eyes tend toward disease and ultimate blindness. These are among the possible results of neglect on our part to do our whole duty. We may build asylums for the blind, we may do everything possible to remedy the defects already existing, yet unless we go down to the very foundation of the trouble and alter existing causes for disturbance we shall in time have as great a percentage of spectacled beings as is now seen in Germany. Remember that this is an age of conservation of energies, not waste.—*W. F. Southard, M. D., San Francisco, Cal., in the Journal of the American Medical Association.*

The Refractionist.

A Journal of Practical Ophthalmology.

FRANCIS F. WHITTIER, M. D., Editor.
74 Boylston Street, Boston.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.
Address all communications to the Editor.

Education, then Legislation.

Owing to the favorable comments received regarding Dr. Pilgrim's article, "Should opticians attempt to fit glasses?" which was begun in the October number and concluded in the present issue, we have decided to furnish reprints of the article complete (22 pages) to oculists, for distribution among patients, for $3.00 per hundred.

Probably not one-tenth of the eye work of the country is in the hands of the physicians,—its proper place. The only way to bring this about is by an educational campaign, not only among the general practioners, but also among the laity.

The beginning of Dr. Pilgrim's article shows the apathy and indifference, (or better, perhaps, ignorance,) of physicians in reference to refraction work. Recently we noticed in a county paper, of one of our New England states, an M. D's recommendation of a local jeweler's ability to properly care for the eye when in need of glasses. This was in a town, the centre of a population of 15,000 inhabitants, where there are ten or twelve resident physicians. It seems to us that it would be a great deal more professional for some one of the physicians to have enterprise enough to investigate refraction work so as to efficiently adjust glasses and take proper care of the eyes of the community, rather than recommend a jeweler or any general merchandise dealer. We have previously urged in these columns (in opposition to the opinion of some oculists, we are aware,) the need of some physician in every town of 5,000 inhabitants who is qualified to do refraction work. The income of this branch of work is fully as great as that of any other department of medicine, and we cannot see why it is not equally as professional for the physician to recommend the town clerk

as an expert in diagnosing small-pox, or the ability of the village druggist as a natural bone-setter, as it is to give a written recommendation as to a jeweler's ability to fit glasses. We are confident, however, that any physician who is at all conversant with refraction work would not give such a recommendation.

If the general practioners are not educated in this subject, we can hardly expect the laity to realize the importance of the matter. Hence the need of education among the physicians. Can the laity be better informed than by the distribution of reprints of such an excellent article as that to which we have referred?

One correspondent says, "We should not be discouraged when we reflect that four years ago not one of the New England states had a law limiting the practice of medicine, whereas all of them now have, I believe." With continued effort, where now one-tenth of the eye work is in the hands of oculists, we trust this will be reversed in the coming decade. The endeavors of the oculist aided by the general practitioner, and those in educational positions, will have to accomplish the revolution.

* * *

Duplicates, etc. Subscribers receiving duplicate copies will please place them where they will do the most good. Sample copies of October and November issues will be sent out together so as to give the leading article complete.

Oculists interested in the line of work indicated in The Refractionist are invited to contribute to its columns. It stands unique by itself, the only medical journal devoted to refraction work. It does not attempt to fill the places occupied by the Archives of Ophthalmology, the Annals of Ophthalmology and Otology, and other excellent journals, but it does attempt to call attention to and endeavor to reform some of the abuses now existing which should be controlled by the coöperation of those interested.

* * *

Education, then Legislation.

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. DECEMBER, 1895. NO. 9.

PRACTICAL RETINOSCOPY.

BY CLARK W. HAWLEY, M. D.

Clinical assistant Royal London Ophthalmic Hospital, London, England; Oculist and Aurist Cook County Hospital; Consulting Oculist and Aurist St. Mary's Mission and Dispensary; Professor Ophthalmology and Otology Harvard Medical College, Chicago.

IN looking up the literature of retinoscopy or the shadow-test as a means of diagnosis in refraction work, I was impressed with its scarcity, especially of a practical character.

Considerable has been brought forth in the way of scientific facts, but they are of little value to the learner. Most men who desire to avail themselves of the advantages of retinoscopy have not the time to spend on the why and wherefore, and to wade through a full exposition of the subject. They desire to get down to actual work at once and later on study out the reasons at their leisure. In fact, the reasons become much easier when one knows retinoscopy practically.

I believe the time is close at hand when the general practitioner will see the necessity of his becoming familiar with the fitting of glasses in the easier cases, and will educate himself accordingly, sending the more difficult cases to the oculist. When that is accomplished, he will be the means of bringing about a much-needed reform, in that he will then make it impossible for the traveling spectacle shark to go into his neighborhood. In retinoscopy he has a method at command which is both accurate, rapid and inexpensive, saving time for himself and his patient.

It is a method somewhat difficult to learn, but that should not stand in the way as, when once mastered, the physician will have a means of diagnosis that will return him many rewards for the time and money spent in learning.

In this series of articles I shall aim, in as practical a manner as possible, to start a beginner, and in doing so leave out all unnecessary scientific

explanations, devoting the space to as many as possible of the different conditions that may occur.

It is today the most reliable method we have of determining errors of refraction. Of all the methods it gives you the most positive information of all conditions with the least possible expediture of time and money. The old method of test-type, astigmatic chart and trial set, is tedious and uncertain, as you must depend entirely on the patient's replies. The measuring by the ophthalmoscope requires a very extensive experience, and then cannot be relied on. The new ophthalmometers can only give you the corneal astigmatism and, as the instruments are cumbersome and expensive, they are not adapted to the use of the ordinary physician or the beginner in ophthalmology. Retinoscopy fills every want; it requires no expensive set of instruments, and gives you all the required information. If you are doing eye work, you must possess an ophthalmoscope of some kind with which very good work may be done, though it is not as serviceable as an especially constructed mirror. You can always have your instrument with you, but an ophthalmometer you cannot.

If you are doing much refraction work, you have a method of recording your cases, but if you are a beginner, I know of no better way to begin these studies, than by presenting to you my record form. I have now used it three years and find but a few minor changes that I would make.

In developing it, I procured as many forms from my friends as possible, then proceeded to leave out all their hobbies and my own as well. I find that by the use of pen and ink that I can make a very creditable record of any case that has so far fallen into my hands.

Below I present the form along with some explanations of same. Most of the remarks tell their own story, but there are a few divisions that need a few words to make them plain to the beginner. I have filled in an actual case from my record book just as it occurs there:

In 1 and 2, I record the vision and astigmatic reading found at the beginning of examination. I indicate the astigmatic condition not from the ordinary clock usually found at the optician's, but from a set of triangles made up of parallel lines which stand at the same angles from lines running from the centre of the clock to the hour numbers. The ordinary clock is useless, except in high degrees of astigmatic error; but the parallel-lined triangles give a very accurate result indeed, even as low as 0.25 D. If my patient is wearing glasses, I measure them, placing this in 3, 4 and 5 and what he can see with them in 6. In 7 you will notice the word "light," here I make a note of the light condition at

M_____ No.___ Address_____ Date_____

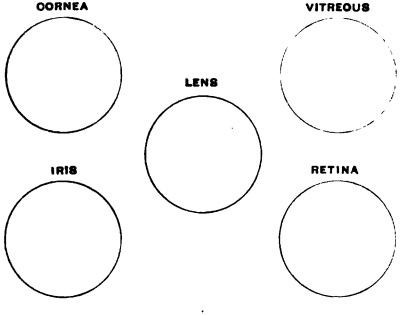
Age_____ Rec. by_____ Address_____

	(1) VISION	(2) ASTIG.	(3) SPH.	(4) CYL.	(5) AXIS	(6) VISION	(7) LIGHT	(8) VISION	(9) ASTIG.	(10) RETINOSCOPY	(11) SPH.	(12) CYL.	(13) AXIS	(14) VISION	(15) LIGHT
R															
L															

Eso._____ Eso. Near_____ R. Hyp._____ R. cat. _____ Sup. O. _____ Ad._____

Exo. _____ Exo. Near_____ L. Hyp._____ L. cat._____ Inf. O._____ Ab._____

	(16) SPH.	(17) CYL.	(18) AXIS	(19) VISION	(20) LIGHT	(21) SPH.	(22) CYL.	(23) AXIS	(24) PRISM	(25) BASE	(26) STYLE	(27) QUAL.	(28) SIZE	(29) P. D.	(30) UP	(31) DOWN
R																
L											FORWARD	BACK	BASE	RIDING	TEMP	L OR S
											CEMENTED		PERFECTION		SPLIT	
Near R																
Near L																
With R											*Reads J. No.*		*at*			*in.*
With L											"	"	"	"		"



REMARKS:

the time of examination, whether good, fair or dark; sometimes artificial is used, which I note. In 15 is another light record, some two hours later after my work is finished when using a mydriatic. I have often found this very valuable when looking up a patient's record. There may be a discrepancy between the visual records which may be explained by the difference in light condition. The time between 15 and 20 is usually two days or more, hence the value of the record.

After filling in up to 7, I make my different muscular tests and record them in the spaces marked between the two forms. I then place the mydriatic in the eyes and usually wait two hours for it to produce its effect, after which I again find out the patient's distant vision and place result in 8 and 9. The next space (10) is reserved for my retinoscopic work, the method of recording which will be fully explained later on. Having found my glasses by that method, or any other you may use, I proceed to vertify the result by putting lenses in my trial frame, placing the final findings in 11, 12, 13, 14 and 15. I now dismiss my patient with the instruction to return on the third day. If he does not need his accommodative power until then, I place nothing in the eyes; but if he must read or work at close range, I drop one drop of eserine into each eye, from a one grain to the ounce solution, and have him do the same at bed-time, when the accommodation is usually restored the next morning if my mydriatic has been cocaine and homatropine. I sometimes loan them a pair of glasses of + 2.50 D, but so many forget to return them that I have not found it profitable.

When they return two days later, the full correction is placed before the eyes and worn for a short time, when if it is hypermetropic in character, I reduce the spherical to the point where they can read 6–6 perfectly. This result is placed in 16, 17, 18, 19 and 20. From 21 to 25 I make up the combination I intend they shall wear, which is usually that in 16–19, with any prisms I may add.

In the form 26–31 I place very careful measurements of the frames desired. This I should advise every oculist to do, as many times a poorly fitting frame undoes all your careful work. When you have paid careful attention to frames for a time, you will be astonished at the numerous little differences that will often cause glasses to be unsatisfactory. Nothing could now persuade me to return to the old way of depending on the optician, no matter how good he may be. He may fill the prescription, but I fill in all the instructions just as I would were I writing one to the druggist; and I always hold the optician strictly responsible, as I would the druggist.

Learn to make very careful measurement, never letting the smallest error leave your office. On your good taste and accuracy will depend

much of your future reputation. If you find that the frames do not fit as they should and you are supplying them yourself from the wholesale dealer, do not let the expense of the change deter you from making it. The patient may not notice it, but the glasses may not be satisfactory and he may go to some one else, when a very small change in the frame was all that was necessary. You may be quite sure very few oculists will protect you; their selfishness will cause them to please the patient to your detriment.

[*To be continued.*]

70 STATE STREET, CHICAGO, ILL.

Selections.

Ocular Symptoms in Diseases of the Spinal Cord.*

Beware of the man whose eye you can never meet. That the eye should show changes in diseases affecting the brain, with which it is so closely connected, is clear, but why in those situated in the spinal cord it is not so easy to comprehend. Ever since the diseases of the "golden bowl" have been the subject of close study, ocular symptoms have been noticed, and, of late years, these same symptoms associated with affections of the "silver cord" have claimed much attention and inquiry.

I regret that I am unable to make any new contribution to our knowledge of the pathological anatomy of these diseases, but hope that my hearers may gain some profit and instruction.

On entering this vast and interesting field one must be very careful to make minute and accurate observations, especially in reference to pupillary signs, as Iwano has found that out of 134 young persons examined 131 had asymmetry of the face, and that the pupils were irregular in 122, and that the largest pupil occurred most frequently on the left side, which was usually the smaller side of the face.

We shall not attempt to cover the whole field which the title of this paper indicates, but only take up certain points that have always interested me.

*Read before the New York Post-Graduate Clinical Society, October 5, 1895.

Your attention will be more particularly called to atrophy of the optic nerve and ophthalmoplegia interna, with but only a passing notice to ophthalmoplegia externa and nystagmus.

Atrophy of the optic nerve comes chiefly under the notice of the ophthalmologist, while the affections of the iris come more commonly under the observation of the physician.

The ocular symptoms in spinal cord disease are to be looked upon as associations and not as effects, and that they are also always the result of degenerative processes in the cord.

The usually slow progress of the spinal symptoms is evidence of this fact.

Among the many degenerative diseases of the cord, it is strange that most of the eye symptoms should be with one of them alone, with tabes dorsalis. The fact that they are associations and not effects, is clearly stated by Gowers in the following manner: —

1. "That disease of any nature may exist in any part of the spinal cord without the occurrence of ocular symptoms, if we except the very rare paralysis of the dilators of the pupil in disease of the sympathetic tract in the cervical region."

2. "The ocular symptoms which may be absent when the cord disease is advanced, may exist in extreme degree when such disease is in a very early stage."

3. "With the single exception of the sympathetic symptoms just mentioned, we know of no anatomical connection or functional mechanism by which the spinal cord disease can produce the ocular symptoms."

Injuries to the Spine.— Experimentally in laboratories injuries to the spinal cord of animals have shown ocular symptoms, and these naturally lead us to expect similar results in man, where injuries to the spinal column have inflicted pressure on the cord.

Mr. Erichsen* of London has done much to bring this to notice, and Allbutt considers it sufficiently frequent to establish a causal relation between the two events.

It is stated on authority that Alexander the Great was in danger of losing his eyesight from the blow of a heavy stone on the back of the neck. Thirty-six per cent of Erichsen's cases showed undoubted eye symptoms.

These are, more commonly, difficulty of seeing in poor light to read, blurring of the type, floating bodies before the eyes, occasionally diplopia with photophobia. The ophthalmoscopic appearances are usually negative.

* Erichsen, "Concussion of the Spine," London, 1875.

Wharton Jones* considers the eye symptoms in these cases due to the disturbance in the ciliospinal centre, and the sympathetic filaments springing from the dorsal and cervical cord.

Other authors have reported severe eye symptoms from comparatively slight injuries of the spine.

I have seen but two cases of concussion of the spine or traumatic neurosis, and in each of these eye symptoms were present in the shape of asthenopia. The fundus in each case was normal and distant vision good, yet difficulty was experienced in reading. Both were females and each had loss of accommodation; that is to say, they could not use the ciliary muscle long without fatigue, and a convex glass had to be given to rectify this difficulty. In neither case was muscular disturbance of the extrinsic muscles of the eye found.

In Caries of the vertebrae, when of traumatic origin, we frequently find intra-ocular symptoms, and the ophthalmoscope usually shows a condition of engagement of the vessels of the optic disc and surrounding parts.

Dr. Chas. S. Bull† reports the histories of eleven cases of traumatic caries of the spine mostly occurring in the cervical, but some also in the dorsal and lumbar regions. Seven had engorgement of retinal veins, with no changes in the arteries; in two choked disc was noticed, and in two anæmia seemed to be present, although the veins were enlarged.

I have examined fifteen cases of ocular disturbance in vertebral caries of traumatic origin and found the following conditions: In two, optic neuritis, with swelling; three, hyperæmia of the disc, with blurred outline, but no œdema; eight had enlarged veins and arteries, normal in size, or, only slightly enlarged, the changes were symmetrical in each eye; two had floating bodies in the vitreous, with enlarged retinal veins; these changes are probably due to the sympathetic filaments springing from the dorsal and cervical cord.

LOCOMOTOR ATAXIA.

The frequency with which optic nerve atrophy occurs in tabes is differently stated. Leber found it present in 26 per cent, Gowers in 20 per cent, Nettleship in 50 per cent, and Dana in 10 per cent.

During the past ten years we have made notes of eighty cases of atrophy of the optic nerve where no other history could be obtained, and of this number thirty-two had the signs of tabes as shown by the absence of the knee jerk; eighteen had ataxic symptoms when first seen.

* "Failure of Sight after Railway and Other Injuries of the Spine and Head," London, 1869

† "Trans. American Ophthal. Society," Vol. II.

In examining the reports of many of the ophthalmic hospitals of this country, we are unable to tell the proportion of optic nerve diseases due to locomotor ataxia, owing to the method of recording diagnoses. Erb found only 12½ per cent of his cases to have atrophy of the optic nerve, so that although it is admitted by all writers as a frequent association, the percentage is at great variance. It has been said that the percentage given by the ophthalmologist is too high; I do not think so but rather that it is due to the fact that the patient seeks advice for failing vision when no signs of ataxia are yet present, and that the observers being on the alert for a cause of the optic atrophy enter into an examination of the general condition of the patient and discover tabetic symptoms. I know this has been my personal experience in this direction. Atrophy of the optic nerve belongs to the more frequent of the complications of tabes; it commonly arises in the initial stage and may be the first manifestation, the amblyopia produced by it may last for as many as ten years before other symptoms of tabes appear, as in the case reported by Charcot. Gowers has also reported similar cases; in one the optic atrophy preceded the locomotor symptoms twenty, and, in another, fifteen years. That optic atrophy ever occurs before the loss of the knee jerk, I am not satisfied; in all the cases under my observation it was absent, and I believe it is well recognized that the loss of the knee jerk may precede for a long time other locomotor symptoms.

When the disease was supposed to be situated and limited in the posterior columns of the cord, the association with it of a peripheral degeneration of the optic nerve was an anomaly; but since the recent pathological researches of Pierret, who has shown that the degeneration of the optic nerve is not the only peripheral lesion, and that that in the cord is not the only central change, he has shown that there is often an independent degeneration in the cutaneous nerves commencing in the extremities, and that the optic nerve change is strictly analogous; that there may also exist a degeneration at the central termination of the optic as well as of other cranial nerves, similar to that existing in the posterior columns of the cord. From his standpoint tabes is considered a "wide sensory neurosis," in the course of which the optic nerve atrophy occurs. Déjérine and Westphal have also enlarged our former narrow conception of the tabetic process. During the period when there is no affection of the patient's gait and only the loss of the patellar reflex, unsteadiness on standing with bare feet close together, with closed eyes (Romberg's symptom), and with lightning pains, there is no doubt that optic atrophy often commences and advances to a considerable degree, and according to Gowers, it occured during this period twice as fre-

quently in this than the later stages of the affection. If no ocular symptoms occur within three years, none will. In my cases fourteen out of thirty-two had only loss of knee jerk and rheumatic pains in the legs. It is rare for it to occur when the ataxia is so great that the patient cannot walk.

The atrophy usually begins in one eye, the left before the other, and may reach a considerable degree before the fellow eye suffers. The immediate cause of the amblyopia in tabes is the gray degeneration of the optic nerves, a degeneration similar in all respects with the changes in the spinal cord. The disease begins at the periphery of the trunk of the optic nerve and gradually attacks the central fibres; it always begins on the trunk of the nerve in the portion nearest the eye, and from thence toward the optic tract.

Sections of the optic nerve show similar lesions to those which are found in the spinal cord. Owing to a degeneration of the medullary sheaths, the nerve fibres reflect less light and appear gray. Compound granule cells are found between the fibres. *The nerve substance* has *disappeared,* the connective tissue is shrunken, and the nerve trunk is decidedly diminished in size. The degeneration is in spots and most usually continues. The narrowing of the visual field would lead us to this conclusion, had not post-mortem changes already shown this condition.

The disease of the optic nerve manifests itself by diminution in the acuteness of vision; the field, which is at first normal, becomes gradually narrower, the field being irregularly contracted. The color field is usually limited before the visual; the perception of green being lost first, then red, and then yellow and blue. Ophthalmoscopic examination shows in the early stages a dirty looking nerve which is indicative of a low grade of neuritis, and this continuing, produces the final full marked appearances of white atrophy of the optic nerve, with narrow arteries and other parts of the fundus appearing normal.

The optic nerve atrophy occurring in tabes is usually progressive and leads to complete blindness, though I have seen two cases where vision was not completely destroyed. And one may observe no ophthalmoscopic change in the fundus and yet amblyopia of a high grade present; in such cases, doubtless, degeneration is retro-bulbar.

The next most frequent ocular sympton in tabes is the pupillary change of the four muscular actions, contraction of the pupil or stimulation of the optic nerve, contraction of the sphincter in association with that of the ciliary and internal recti-muscles, and contraction of the dilator fibres of the iris or stimulation of the skin, and contraction of the

ciliary muscle on accommodation, some or all may be lost in association with spinal disease. These changes depend upon at least three centres capable of separate action, all of which probably lie in the tract beneath the aqueduct of Sylvius. Experiments made by Hensen make it likely that the anterior portion of the tract governs accommodation, and the centre next behind is the reflex contraction of the iris. On the outer side of the latter is a centre on which depends the reflex sensory dilatation of the pupil. The efferent paths of the two former are through the third nerve. As yet we know little as to the centre for the contraction of the iris which is associated with accommodation, not knowing whether the nucleus for the ciliary muscle is connected with the mechanism for contraction of the pupil at the centre, or in the lenticular ganglion, or on the ganglionic mechanism within the eye. It is more probable that the connection is in the lenticular ganglion.

The path by which stimulation of the skin causes reflex dilatation of the iris is circuitous. The efferent impulse reaches the centre by the cervical part of the spinal cord when the skin of the neck is stimulated, and the efferent impulse descends the cervical cord, thence to the superior thoracic ganglion of the sympathetic, and then ascends the sympathetic to the eye.

These pupillary symptoms are as common in tabes as they are rare in other spinal diseases. The most common being the loss of reflex action to light, while the pupil still contracts to accommodation, the "Argyle Robertson" pupil or reflex iridoplegia.

Associated with this symptom is also a loss of the dilatation of the pupil on stimulation of the skin. Next in frequency, but very much less common, is paralysis of all the intrinsic muscles of the eye, the ophthalmoplegia interna of Hutchinson.

The rarest is loss of accommodation, cycloplegia, without loss of reflex action.

If we embrace all of the pupillary symptoms, both slight and transitory and the more profound, we will find them present according to Erb in more than one-half of all tabetic cases. Gowers in seventy-two cases of primary degenerative ataxia found the internal muscles of the eye affected in 92 per cent.

The percentage of his cases with pupillary signs was in the first stage eighty-four, in the second, ninety-three, and in the third, one hundred.

In forty one of our own cases already spoken of, the "Argyll Robertson" pupil was present.

With the light reflex is lost the pupils are often small, but not necessarily so. When there is loss of accommodation they are rarely very small, less than 2½ mm. and are often 4 or 5 mm. in diameter.

The reflex dilatation of the pupil when the skin is stimulated is a phenomenon closely allied to the contraction of arteries which may be produced on animals by the stimulus of pain. The dilatation of the pupil may be obtained by irritating the skin of the face or the neck; it is double, that is the stimulation of one side causes dilatation of both pupils.

The skin reflex is usually absent when the light reflex is lost; the skin reflex may be retained when cycloplegia is present.

Dr. Hughlings Jackson has reported a case where vision was absolutely lost by optic atrophy, in whom the Argyll Robertson pupil existed, and when the patient "made believe" look at the clouds the pupil enlarged, and contracted when he made the effort to look at a near object.

In examining the reflex dilatation which accompanies stimulation of the skin, precautions as follows should be observed: The eye should be shaded from a glare of light, voluntary movements on the part of the patient should be arrested during the test, as any movement being made the pupils being shaded will cause dilatation of the pupils.

Uhthoff* found reflex immobility of the pupil combined with preservation of reaction on convergence in 67 per cent of all tabetic cases, and also the pupils were found to be unequal in one-fourth of the cases; one-sided cycloplegia was found in only five out of 166 cases. Reflex immobility of the pupil without reaction on convergence was found in thirty cases.

We must not omit the paralyses of the extrinsic muscles of the eye, that are so commonly seen in tabes, usually either the abducens or the motor oculi and rarely the fourth nerve, which give rise to various symptoms of dizziness, diplopia and strabismus. Graefe has pointed out that tabetic patents show little disposition to fuse the images in binocular vision, and this is taken as sign of the central origin of the affection.

These muscular paralyses are frequent in the early stages of the disease; they are transient often in character, and this fact has not been very readily explained. Ptosis is also present when no other branch of the third nerve is involved.

In 203 cases of tabes collected from various sources, paralysis of ocular muscles occurred in fifty-two, or over 25 per cent.

GENERAL PARESIS OF THE INSANE.

In this disease, ocular symptoms are quite prevalent, and in great variety. Mr. W. B. Lewis of Wakefield, England, has collected the histories of sixty patients, with the following result: Loss of reaction of

* Berlin, "Klinischer Wochensch." 1886, No. 3.

the pupil to light, 78 per cent; movements on accommodation, associated iridoplegia, 43 per cent; reflex dilatation to cutaneous stimulation was lost in 63 per cent; complete fixity of the pupil without impairment of accommodation was found in 15 per cent; in 7 per cent, ophthalmoplegia interna occurred, although it was rarely complete as regards the ciliary muscle.

He summarizes as follows:—

1. A loss of reflex dilatation to sensory stimulation occurs in a very large proportion of cases.

2. Reflex iridoplegia (loss of action to light) next to the preceding is the most frequent accompaniment of the disease.

3. Complete loss of movements of accommodation occurred in 25 per cent.

4. Cycloplegia associated with the latter in 4 of the 60 (more or less complete), and was found only in the advanced stages of the disease.

And he concludes that the sequence of morbid phenomena occurring in the iris is as follows: Paralysis of reflex dilatation to cutaneous stimulation, reflex iridoplegia probably shown at first by an initial contraction, followed by dilatation under full focal light, and passing into a later stage of immobility, and occasionally complete ophthalmoplegia interna. Optic nerve atrophy occurs, and in 22 cases examined by Dr. Lanford, London, Eng., three were found thus affected.

Nystagmus is associated with tabes, but is a rare symptom in this affection, and is usually found in multiple-sclerosis. It has been ably set forth by Friedreich, who states that it is always bilateral, and that the movements of the eyes are rotary and irregular, as seen in the case presented to you. It does not occur during rest, but always on an attempt to fix the eye.

He considers it due to a form of ataxy of the movements of the eye, and speaks of it as ataxic nystagmus, and the cause to be due to a disturbance of the coördinatory tracts which lead from the centres of coördination to the nuclei of the nerves of the ocular muscles lying on the floor of the fourth ventricle, and that it does not occur in spinal disease until the medulla is involved. Pierret explains these movements on the ground of the primary disease of the sensitive root tracts of the trigeminus in the medulla.

Nystagmus is a very common symptom of multiple-sclerosis, and it is increased by any effort of the will or any violent emotion. According to Charcot it is met with in one-half the cases.

In multiple-sclerosis of the cord we have temporary or permanent diplopia, due to paralysis of the various ocular muscles. Amblyopia is

also observed, but it rarely, as in tabes, leads to positive blindness, with optic nerve atrophy, although in rare cases it does. The difficulty is probably due to nodules of sclerosis in the optic tracts and optic nerve. The paralysis of the external muscles of the eye, due to spinal cord disease, we will reserve mention of until a subsequent time, as the subject of ophthalmoplegia externa is of much interest and scope.—*Willam Oliver Moore, M. D., in The Post-Graduate, November, 1895.*

* * *

Astigmatism of Twenty-Eight Dioptries.

Of the great variety of cases that come under the hands of the oculist, there are none from which such gratifying results (both for patient as well as physician) are obtainable as from the various errors of refraction, either congenital or acquired, causing both imperfect vision and troublesome reflexes.

This patient whom I present tonight exhibits most impressively the damage capable of being wrought upon the eyes by that obstinate disease—trachoma, commonly called granulated lids. As a child he became the victim of that affliction, and the left eye was eventually so seriously impaired that, ten years ago, it became necessary to remove it. Soon after this the right eye became useless, owing to severe inflammation, involving the cornea; and after this subsided, the cornea, although clear and transparent, was left seriously misshapen, the result of cicatricial contraction and loss of substance in the cornea itself. Trachomatous inflammation has long since subsided, but has left the one remaining eye with vision less than 1-30, merely enough to see his way about; he is totally unable to earn his own living. For years he has been in the hands of various oculists, both here and in other cities, but never received any encouragement as to betterment of his vision. An oculist in Jamestown, N. Y., was the only one who ever attempted to fit a correcting lens, and he was wearing that glass when he was referred to me. It was a convex cylinder of 12 dioptries, axis 180°; it enabled him to work in a shoe factory, but he relied more on his sense of touch than upon his sight.

A glance at the cornea through Placido's keratoscope, revealing a vertical, long, thin oval, convinced me it was a case of astigmatism, of very high degree, against the rule, and probably of mixed type. Javal's keratometer confirmed my belief; the degree of refraction in the horizontal meridian was 60 dioptries, and that of the vertical meridian 32 D. This was a departure from the normal average of 17 D. in excess in the

horizontal, and 11 D. deficiency in the vertical. This corneal correction, added to an hypermetropia of 5 D., gave the immense improvement of vision = ½, or fifteen-fold better than vision without the glass. He now reads any print in the newspaper, and is perfectly able to return to his regular work, that of operating a machine in a shoe factory. The lens he is wearing is a beautiful specimen of the grinder's art; it is a crossed cylinder, *i. e.*, — 12. D. ax 95° ⊂ + 16 D. ax 5°.

The successful result obtained in this case is a strong endorsement of the value of the keratometer. To have attempted to estimate the error by subjective tests would have been hopeless, and the ophthalmoscope or the scioscopic mirror would be equally inadequate. To my knowledge, ophthalmic literature does not record a more interesting case of astigmatism.—*Dr. Charles W. Dodd in The Cincinnati Lancet-Clinic.*

* * *

Positive Aberation. Most persons who wear correcting glasses for hyperopia, and see perfectly through them during the day, see better without their glasses at dusk. Dr. Jackson showed that this was due to the lower hyperopia, or actual myopia, present at the margin of most dilated pupils; so that when the patient has to rely on this larger area of the dilated pupil to see in a dim light, the glasses make him nearsighted. This optical defeat he calls the positive aberation of the eye, and finds it present in some degree in a large majority of all eyes.—*The Philadelphia Polyclinic.*

The Refractionist.

A Journal of Practical Ophthalmology.

FRANCIS F. WHITTIER, M. D., Editor.
74 Boylston Street, Boston.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.
Address all communications to the Editor.

Fees. Those desiring to provide their own work will be interested in the following letter, which is a sample of many received:

DEAR DOCTOR,—In volume I., No. 4, of The Refractionist, I noticed on page 58 the editorial sentence, "Our patients prefer paying us *one fee* rather than being sent to some optician who," etc. I would like to ask if your personal experience makes it practicable to furnish the frame and lenses for the fee of a stated sum or whether different fees for different kinds of lenses are asked. Thus, so much for plain astigmatic and more for sphero-cylindrical lenses. Please give me your experience and the method of others within your knowledge. If it were possible, I would be glad to tell the patient, who asks what it will cost to be fitted to a pair of glasses, that it will cost $5 in steel, $10 in gold; but there are so many kinds of frames and different kinds of lenses,—one patient needs two pairs, and another only one, one wishes to use old frames and another bar-spring, so that I have doubted the practicability of a uniform fee. I have an examination fee of $3, and charge the rates for frames and lenses put down in the catalogues of ———. I am trying to meet the old question, "How can I prevent opticians taking advantage of prices to cut under my own." Respectfully ———.

Our usual method is to charge a regular fee (which unfortunately varies with different oculists, from nothing upwards,) to which is added the price of optical work furnished as per usual retail rates of leading houses. As for instance, medium weight 10K, riding bow, spectacle frames, or eyeglass frames $6.00, plus $1.00 for sphericals, $1.50 for cylinders, $3.00 for sphero-cylinders, etc.; same styles of frames in steel $1.50. These are about the prices charged by oculists who provide their own work, and their number is rapidly increasing. The average fee is $5.00 for first call, $3.00 for subsequent calls. Educating the public is the best means of preventing the optician (?) from cutting prices. Let those who persist in intrusting their eyes to them pay the penalty later. Good ophthalmological service deserves a fair return. Do good work and maintain prices.

The Refractionist. This journal has ever been outspoken, and heralds with no uncertain sound the objects for which it was established. That a change is rapidly coming over the profession, we are assured daily in our mail by letters of commendation, orders for reprints of valuable articles for office distribution, and in other ways.

The only way our efforts can be sustained is by the aid of those interested to see an improvement in this department of medicine. To make the journal more of a success, two things are necessary,—

1st, Subscriptions. The field is necessarily limited, and it is expensive conducting a journal. You can assist by becoming a subscriber, or if a subscriber and in arrears, by remitting at once.

2d, By contributing articles from your personal work. Any oculist has cases which would be practically interesting to the general practitioner as well as other oculists. Your aid is solicited in these two ways, and solicited *now*.

* * *

Co-Editor and Removal. Dr. Maurice F. Pilgrim, whose able articles in The Refractionist during the past year have doubtless made his name favorably known to its readers, will hereafter be a co-editor of this journal. Dr. Pilgrim has been obliged to relinquish a lucrative practice at Carbondale, Pa., on account of the malarial condition of the locality, and has removed to Portland, Me., and located for practice at 472 Congress street. The Doctor has for the past five or six years been very active by pen and personal influence in his endeavors to stamp out refracting opticianism, and at the same time to raise the standard among ophthalmologists. The Refractionist can warmly recommend Dr. Pilgrim to the profession of Portland and vicinity as a gentleman of education and experience, whom they will find at all times a courteous and helpful colleague.

* * *

Missionary Work. To those wishing 25 copies monthly for distribution among neighboring general practitioners or patients, we offer the low rate of $10.00 (40 cents per copy yearly), or $15.00, including card for one year in the Directory. Can you educate the people in your locality in a more direct way, and how will it be as a business investment for you? Copies will be mailed direct from the office if preferred.

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. JANUARY, 1896. NO. 10.

PRACTICAL RETINOSCOPY.

BY C. W. HAWLEY, M. D., CHICAGO, ILL.

[*Continued from December number.*]

THE necessary instruments and conditions to employ retinoscopy successfully in refraction work are the following: A concave mirror of 22 centimeters focus, or a plain one, the former being the one more commonly used. A very convenient size is one whose diameter will measure between 40 and 45 millimeters; the hole through the center should have a diameter of 3 to 5 millimeters, the larger one being preferable, and the edges of the hole blackened so as to give no reflection. The surface should be well and evenly made. The shape I prefer is one the handle of which folds over on the mirror, making it compact so as to be carried in the pocket.

Next a good, clear and fairly large source of light is necessary. Good work can be done by an ordinary lamp, with the flat surface of the blaze toward your mirror; but an argand burner of oil or gas is better. A very convenient light may be obtained by fitting a metal chimney over an argand burner and making a hole of about one inch in diameter in the side. This gives a round and ideal light for retinoscopy and general ophthalmoscopic work as well, and assists very materially in darkening the office, a very desirable condition, as the darker the room the more accurately the work can be done.

The light should be placed on a bracket or stand, so as to be above and behind the patient's head, and be so adjusted as to be raised or lowered at pleasure. This need not be an elaborate and expensive one unless you so desire. A little ingenuity and two dollars enabled me to use for a long time very satisfactorily an argand oil burner on an ordinary lamp bracket that sets into various sockets at different heights along the office wall, thus gaining any desirable position. When gas was added to my office, at small expense I arranged my bracket for gas,

with a piece of rubber hose for connection and to make it more readily adjustable to the patient's position.

Then a trial frame and a set of lenses from some reliable maker. The frame should be of such shape that lenses can be easily dropped in as you are working in a very dim light, and off at arm's length. Several styles are on the market, and of these I find the open ones without springs and as simple as possible, but so arranged that you can adjust the pupillary distance, the most convenient for general purposes.

A dark room is very necessary for the best results. This you may obtain in various ways, if you cannot have a separate room fitted up. I have covered the side walls of one end of my office with curtains of cheap, black cloth, hung so they may be drawn to one side, thus not disfiguring my room; and across the same space I have sliding chenille curtains lined with the same black material. When these and the side curtains are draped back the effect is not undesirable. Make this room of fair size and as dark as possible. Light walls give you so much reflected light on the face of the patient that you cannot detect the finer movements of the shadows.

Having arranged all the mechanical departments for work, you are now ready for the patient. Your first step is to get all the knowledge possible of the eye conditions from inspection, vision and muscular test; and last, but not necessarily least, as much as you can of the patient's general condition. The next condition is a paralyzed ciliary muscle and dilated pupil. This we obtain by using homatropine and cocaine dissolved in castor oil or by the use of gelatine discs of the same combination. My method is to put one disc into each eye in the following manner: Rolling up a small quantity of absorbent cotton, about twice the size of a common match, I moisten it and squeeze out the surplus moisture; with this I pick up a disc and request the patient to look at the ceiling, pulling down the lower lid with my finger. I now carefully lay a disc against each exposed eye-ball below the cornea where it will adhere. When both are supposed to be in place, I always make an inspection to be sure they have not been forced out in the act of closing the eyes, which is often done.

I now place my patient in the darkest corner of my office with his back to the light, with the injunction not to open the eyes. The object of this is twofold, by keeping the eyes closed the cornea will not become coated with gelatine, and there will be the minimum of ciliary action to oppose the action of the homatropine and cocaine.

At the end of 20 or 30 minutes two more discs are put in, and by the end of an hour from the first instillation I expect to find a dilated

pupil and a paralyzed ciliary muscle. Some ophthalmologists prefer atropine claiming that homatropine and cocaine are not reliable. So far I have not found it necessary to put my patients to the annoyance necessary in the use of atropine.

Take the patient into the dark room, placing him with his back to the light, which should be just behind and above his head. Adjust the trial frame so that he will look through the centre of the eye pieces and cover with a blind the eye not to be examined.

Let this patient be the one I have just dismissed, and we will proceed to determine her refraction. I will take you, not through some theoretical steps, but over the work just as I did it a few moments ago, omitting nothing. I select this case because it so thoroughly represents the actual work and the value of retinoscopy to the worker. This patient comes to me thoroughly discouraged by her fruitless attempts to get glasses, having tried several opticians, one oculist, and last a general practitioner who does considerable refraction work. Had the oculist or the practitioner been versed in retinoscopy, fifteen minutes' work would have enabled either to have fitted glasses to her. The opticians could not, because they dared not use the mydriatic. Both the oculist and the practitioner, the patient said, had spent many hours trying on the many combinations possible with the large number of lenses at hand, but could find nothing satisfactory, when with retinoscopy the problem could have been solved in fifteen minutes, and we should have been deprived of our example. I say fifteen minutes, but the time for one expert in its use should be less than five.

Taking the patient into the dark room and placing her in the position described, mine being directly opposite and at arm's length, and placing my mirror before my right eye (with any error of refraction corrected) so that I may look through the hole, I request the patient to look at the same hole while I throw the light into the patient's right eye, the left being covered. In this position, you work directly in the line of vision.

Surveying the pupillary area, I find a red reflex, the image of the light reflected from the retina. By a very slight movement of my mirror about its horizontal axis, the image is discovered to be bounded by two shadows, one above and one below.

These shadows seem to have very nearly a linear edge and are very faint. As I rotate my mirror down, the lower shadow moves slowly up across the field, the direction being opposite to the movement of the mirror. When I rotate my mirror up, the upper shadow moves slowly down. Now rotating my glass about its vertical axis, I discover two very dense shadows and they move very rapidly across the pupillary space in

the opposite direction to rotation. From certain laws governing the movements of these shadows, I arrive at the following conclusion: that I am to deal with a case of either simple hypermetropic astigmatism or mixed astigmatism. The deductions to be derived from the shadows and their movements will be discussed briefly later on.

I placed before the patient's right eye + 1.00 D. spherical, and rotating the mirror about its horizontal axis, when I find the shadows moving decidedly with the movements of the mirror or are reversed in direction to the movements of shadows without the lens. I now know that I have placed too strong a lens before the eye or over-corrected it. Replacing the + 1.00 D. lens by one of + 0.50 D. spherical, I find now that the shadows have disappeared from the vertical meridian. This is the desired point to be reached in every case.

To record the findings, a cross is very convenient, thus:—

	+ .50
	+ 4.50 ad.
+ 4.50 ad.	
0.	

The position above is used for the right eye, and that below for the left. This same cross is used in my record form under the head of "retinoscopy." I usually follow one system of placing the marking, as I always work out the least prominent or weaker meridian first using spherical lenses, and the more prominent by the addition of a cylinder. This uniformity becomes necessary to indicate the direction of the axis of the cylinder in comparisons later on. If the axis of the cylinder is vertical, I place the record of it next the horizontal line, and the spherical just above and at the end of the vertical line. After the cylinder, I write "ad." to indicate that it is such and added to the above. I reverse the writing if the axis of cylinder is horizontal.

Having found that the spherical + 0.50 D. corrects the vertical meridian, I leave it in place. As the movements of the shadows in the horizontal meridian are against the rotation, dense and rapid in movement, I know the degree of the error is high, so I place a + 3.50 D. cylinder in front of the + 0.50 D. spherical, with its axis vertical, and on rotating my mirror, I discover the shadows still travel against the rotation, but they are less dense and move much more slowly across the pupillary space, which shows I am approaching the turning point. Replacing the cylinder with a + 4.00 D. and finding a very faint shadow moving against the mirror very slowly, I make another change of cylinder and place a + 4.50 D., and now find the shadows have disappeared. This is probably the lens the patient will accept. To make sure I have reached the turning

point, I place a + 5.00 D, and find that it reverses the movement, that is moving slightly with the rotation and very slowly, showing that + 5.00 D. over-corrects. I record the + 4.50 D. on the horizontal line of cross, with the abbreviation "ad." after it. This indicates that I have a cylinder added to + 0.50 D. spherical with its axis vertical.

The following is then the correction as shown by retinoscopy: + 0.50 D. spherical with + 4.50 D. cylinder, axis about 90°. But this does not represent the lenses that correct the error of refraction, to find which we must subtract + 1.00 D. spherical in all cases from the spherical of the equation, the cylinder always remaining the same. The reason for this we will not discuss. Subtracting this, we find the following, —0.50 D. spherical with + 4.50 D. cylinder, axis about 90°, as the combination the patient should see the best with. This, of course, on the supposition that I have read my shadows correctly.

Now, transferring the blind to the right eye, and surveying the pupillary area of left eye, I find on rotating the mirror about its horizontal axis, that I get no shadow movements. But revolving it about its vertical axis, I find the same dense and rapidly moving shadows travelling across the space and in the opposite direction to the mirror's movements as were seen in the right eye. As they have about the same density and rapidity, I concluded to try the + 4.50 D. cylinder with its axis vertical, and discover that the shadows do not appear on rotating the mirror. This gives me for my retinoscopy nothing in the vertical with + 4.50 D. cylinder. Treating this in the same manner as the corresponding equation of the right eye, by subtracting + 1.00 D. spherical, I obtain as my correcting lenses —1.00 D. spherical, with + 4.50 D. cylinder, axis about 90°. I use the term "about," as retinoscopy only gives the axis approximately.

Now, placing the patient 20 feet from my test chart, and placing the corrected lenses before the eye, I proceed to test the ability to read with each eye separately. Taking the right eye first, she readily reads 6/12. I now put a —0.25 D. spherical before the eye, and she says it is not as good, and on trying + 0.25 D. spherical in same way, the reply is "not as good." Now, putting up cylinders each way from + 4.50 D. I find no improvement, hence the assumed correction must be correct, having found the axis to be at 90°. We can now assure her that no other combination would do better for her. This is an absolute correction.

Treating the left eye in a similar way, we find that our retinoscopy was correct, and we have for her lenses these :—

R. E. — 0.50 D. s ⊃ + 4.50 D. axis 90°.
L. E. — 1.00 D. s ⊃ + 4.50 D. axis 90°.

We arrived at this conclusion, not by guess-work, but by a method as nearly perfect as the present knowledge of refraction will permit. First, independently of patient, and confirmed afterwards by her assistance.

I now dismiss my patient with instructions to return on the third day, when her accommodation will be fully restored and we will see how she will accept the above compound lenses. She did so, and is now wearing them with perfect comfort. I have heard from her since this article was started, with the injunction to repair the broken lens and return the spectacles as soon as possible, as she could do nothing now without them.

The above description is given exactly as it occurred, and the final result did not vary 0.25 D. from that found by retinoscopy. Do not expect to be thus accurate at the start or even after considerable practice, as it takes much time and patience to be expert at the work. But do not be discouraged; though you may vary some you can at least determine very closely the result, and thus save much time.

I did not keep accurate account of the time consumed, but am sure that ten minutes would cover it, from the time we entered the dark room until I dismissed her. She remarked the difference in time consumed by retinoscopy and that by the other attempt, and the accuracy of the result.

Here I wish to tabulate some facts to be borne in mind of what we have developed in this description.

First — That, by rotation of the mirror, we discover vertical and horizontal shadows.

Second — That the vertical shadows were dense and moved rapidly, and the horizontal ones were faint and moved slowly.

Third — They all moved against the rotation of the mirror.

Fourth — That convex lenses were needed to disperse these shadows, one of low degree and one of high.

Fifth — That in all cases + 1.00 D. spherical, must be subtracted from the spherical, only leaving the cylinder the same to obtain the correcting lenses.

Sixth — With a concave mirror, when the shadows move against the rotation, convex lenses are required to turn the shadow with the rotation. And from the density and the rapidity of movement of the shadows can be estimated the degree of the error, whether great or small. We have also found that if retinoscopy gives the correction as less than + 1.00 D. that the true condition is one of myopia, and if above + 1.00 D. of hypermetropia. This example gives both. If the shadow is more dense and moves more rapidly in one direction than in the other meridian, it is a case of astigmatism.

[*To be continued.*]

REPORT ON EXAMINATIONS OF THE EYES OF 1900 SCHOOL CHILDREN OF THE PUBLIC SCHOOLS OF SAN FRANCISCO.

By KASPAR PISCHL, M. D., of San Francisco.

[Read and discussed before the Ophthalmological section of the American Medical Association at its forty-fifth meeting, June 7, 1894.]

SINCE Professor Jaeger, of Vienna, in 1861, had begun the first scientific examination of the eyes of school children, over 200,000 pupils in all parts of the civilized world have been examined. All those investigations have proven that myopia stands in direct proportion to the education of the people. If I venture to ask your attention for a few minutes only to hear the reports of the examinations made in the schools of San Francisco, I do not pretend to show you anything new, but I hope it will be interesting enough to compare the conditions of the eyes of the children in this new country with those of other countries.

To enable you to judge of the data of my examination, I will explain in a few words the method I employed. I examined the sight of every child, each eye separately, with Snellin's letters. When I found normal sight not impaired by putting before the eyes + 1 D, I marked hypermetropia. If + 1 D. blurred the sight, emetropia. This last column is not reliable. I am sure that many hypermetropic and astigmatic eyes were classed among emetropia. Those who with one or both eyes did not show normal sight were examined with the ophthalmoscope. Every pupil was examined regarding the conjunctiva and lids. A glance at Table I. shows us at once an increase of myopia with the grade of the class; from 3.98 per cent in the grammar school to 11.59 per cent in the normal school. At the same time, the number of pupils with normal sight decreases from 90.20 to 75.71 per cent. This deficiency of sight and increase of myopia is most prominent among the girls of the high and normal schools.

SAN FRANCISCO SCHOOLS, 1891–92, PERCENTAGE OF.

Schools.	Number of Scholars.	E.	An.	H.	M.	Conj.	6/6 Both E.	6/6 One E.	6/6 Both E.
Grammar.....	1,280	68.60	6.32	20.9	3.98	26 25	90 20	7.03	2.77
Boys' High	305	76.06	13.12	4.59	0 23	31.11	85.91	7.86	6.23
Girls' High	299	69 68	9.28	14.02	7.02	41.00	80 66	5.00	14.34
Normal Class ..	69	63.76	18.86	5.79	11.59	41.42	75.71	1.00	23.29
Total.....	1,953	69.52	11.89	11.12	7.20	34.94	83.7	5.22	11.65

* * * * * * * * *

This fact is quite in accordance with the observations of Dr. Gould, and Dr. Southard, our esteemed colleague present, who, in his examinations of the age of the students of the University, as well as his analyses of 1,300 cases of refraction, found myopia or refraction errors in general more frequent in the female sex than the male. He gives a clear explanation for it: They use their eyes more. In Europe we find the contrary to be the case. There the boy gets a much better education; boys only are admitted to the gymnasium and then to the university, and among those students we find over 50 per cent myopia.

Of all the myopic pupils 25.25 per cent are of American parentage, 25.25 of mixed American and European parentage, and 49.50 per cent are of European parentage.

With conjunctivitis I marked irritation, simple and follicular conjunctivitis. This affection increases in number with the classes.

The fact that myopia is much less prevalent here among children than in Europe, or even in the East, may be explained by their better physical development, caused by an abundance of good food, due to our fertile soil, and the almost constant outdoor life permitted by our wonderful climate.

In conclusion, I will repeat that these school examinations do not pretend to be of the exactness of the office examinations, but I consider them exact enough for statistical purposes. The column for myopia I believe to be reliable; the column for hypermotropia probably shows too small a percentage, as some hypermetropic and astigmatic eyes are classed among emetropia, having normal sight. An exact examination of refraction with mydriatic was impossible, as it would not have been permitted by the school authorities.

The great increase of the conjunctival affection with the grade of the classes points to the existence of eye-strain, which in a great many cases may be caused by hypermetropic astigmatism; therefore, an exact examination of every pupil would be desirable.

DISCUSSION.

DR. WEER — It strikes me that physicians assume too much in regard to the eye. If there is anything that makes an eye-man tired, it is to see some one attempt to do something according to some hypothetic theory, and make a dismal failure of it. I cannot understand how the use of test-cards is any test for hypermetropia or myopia. It strikes me that a person having astigmatism of very low degree and in ill health, would have disturbance of vision. I have been acquainted with one of

the assistants of the Manhattan Eye and Ear Hospital in New York City who had 12 D. astigmatism and never wore a glass.

I would like to ask how, in determining the hypermetropia or myopia, do you dispose of the accommodation? If I remember correctly, there is a vasomotor nervous system, and I have had pupils stand up in front of me whose vasomotor and spinal nervous systems were so thrilled that they had lost entire control of every sphincter muscle in the body.

Now, you will all agree that one of our great troubles is our accommodation. This seems to me to be a point that should be taken into consideration in determining the hypermetropia of school children. In the dark-room of the Manhattan Eye and Ear Hospital we were requested to examine a very marked case of myopia. I examined the case with my ophthalmoscope, and I pride myself on the use of it. If I see the blood vessels and the velvety appearance, I turn the glass, and if the velvety appearance comes out stronger than the white lines, then I say I have not here a case of myopia. I ran up to + 8 D. and got a perfectly clear vision of the disc and the velvety condition of the retina. I remarked that it was a case of high degree of hypermetropia, and it was decided by the great Dr. Morrisen that it was hypermetropia. There we had a patient who had been diagnosed by several physicians as myopic. That is merely a mistake. It illustrates the fact that if you rely on the test-card to decide what the error is, and pronounce that child myopic and attempt to give it correction with a minus glass, it would be entirely an error. There is another interrogation I would like to make for my own information. I notice, according to the chart, that as the school life advances, the conjunctivitis advances. Might not that be from eye-strain? Another thing — I have been so unfortunate as to just conclude fitting patients when they had a spell of sickness. Upon recovery I found that my glass was entirely useless. This brings up another matter I wish to advance: Is not the hypermetropic eye the normal eye? Is not the emetropic eye, the uncommon eye, called the normal eye?

DR. YOUNG — I look upon all these statistics with regard to school children with a little allowance. If we could be sure that those marked for myopia were myopia — but with the methods heretofore employed, I think there is room for doubt about it. There is but one way I can imagine, without an enormous amount of work that we can get at it with anything like accuracy, and that is we must make ourselves expert skiascopists. I should not be in dependence myself upon the lenses for half the cases. I believe when we get statistics by this method of examination, we will get something very much more reliable.

* * * * * * * * *

DR. PISCHL — Mr. Chairman, I started the examination in order to compare especially the myopia which I might find here with the schools of Europe. I knew from the beginning, and I said this in my paper, that in the schools I could not possibly find out exactly the hypermetropia or astigmatism. That can only be done in the office. It cannot be done in the school-room, and would not have been permitted. It would have kept the child away from the school-rooms, and would have been impossible. Many of my scholars were hypermetropic or astigmatic, as I said in my paper. As to those which were not, that could not be decided. But I think the numbers for myopia are reliable. I do not think it necessary to apply the ophthalmoscope for myopia. The trouble in the conjunctiva or the irritation increased with the classes to 41 per cent, showing clearly or at least hinting that there is eye-strain in many cases, and giving us the hint that not such a great portion have normal sight. They have errors which could only be corrected in the office.

Two points developed in the discussion as reported above, deserve special attention and should be emphasized, viz.: *1st.*—The tendency of myopia to steadily increase grade by grade, thus keeping corresponding pace with the ever increasing pressure that characterizes modern school life and school methods. *2d.*—The inefficiency and, therefore, the *unreliability*, of the test-card as the sole means of determining refraction.

I. It is not supposable in the presence of facts so well known to every physician, that Dr. Pischl's precentages are peculiar to the schools of San Francisco. Similar examinations conducted in the schools in any of the larger cities of the country would doubtless disclose as high an average of ametropia, and, in New England, probably, the percentage would be very much higher.

It cannot be denied that the present tendency of American school life is toward myopia, and that it is yearly growing worse. We know that civilization alone is responsible for this malady. A recent writer has characterized our modern schools as "absolute manufactories of the short-sighted,— a variety of the human race which has been created within historic time." It is time that parents and teachers came to clearly understand that myopia is not a misfortune merely, but very frequently a *malady*. The debonoir manner in which parents are wont to speak of their young children as being a "little near-sighted" must speedily give place to more serious concern and thoughtfulness if the next generation is not to witness a marked increase in blindness. The public, especially parents and teachers, ought to be taught that myopia in the young is an affection that bodes only evil, "and that continually," to its victims. They should be made to realize that extreme cases of near-sightedness are in great danger of conversion into absolute blindness in consequence of excessive eye-strain. No one can safely predict in advance the eventual outcome of a given case of myopia *except under conditions*, and not always accurately then. Those conditions, it is almost needless to remark, are the correction of the bad refraction by glasses and the *prudent use of the eyes ever thereafter*.

It is a great responsibility that devolves upon the parents of the young myope, and yet how lightly it is oftentimes met! The teachers in the public schools also have a responsibility almost equalling that of the parent. Of what avail is it to send a child to school with its refraction carefully corrected by glasses, if its teacher allows it to assume and maintain cramped positions during study hours? Perhaps the teacher does not know that a constant stooping posture abnormally fills the ocular blood vessels, thus causing congestion, and that its long continuance must inevitably induce permanent changes in the eye structure, hurtful of vision. But is it not the teacher's duty to know this and be able to exercise an intelligent supervision over the habits of their pupils during study hours? Is any qualification more important than this?

II. We heartily agree with Drs. Weer and Young as to the untrustworthiness of the test-card in determining refraction, which is the method employed in the school examinations that have thus far been made. Reliance solely or mainly upon such a method is unreliable everywhere, whether conducted in the school-room or in the consultation room of the opthalmologist. It follows, therefore, that if more thorough examinations could be made, such as are made, for instance, by the opthalmologist at his office, a much higher percentage of ametropia would be disclosed. Moreover, as has often been pointed out in this journal, it is where the ametropia is *latent* and, consequently, uncorrected, that the greatest discomfort and mischief result to the eye. But in the present undeveloped state of public feeling upon this subject, we must be content if permitted to make even the crudest sort of an examination, striving, meanwhile, to awaken a deeper interest in the minds of educators and parents as to the necessity not only of having the work done, but done in the most thorough manner possible. That would very naturally and properly open up to consideration the whole subject of the use of mydriatics. It is entirely possible to educate the general public out of its present apprehension in regard to their employment. Truth, if steadily adhered to, is certain to prevail in the end, and though all that now seems desirable in these proposed school examinations is not at once attainable, opthalmologists have only to be true to themselves and the common cause, to make its complete triumph sure. It is greatly to be feared, however, that many excellent practitioners have too often attempted refraction work in their own offices without using a mydriatic, although conscious of its imperative need, through fear of losing popularity in the community if they insisted upon its employment. The better method would be to boldly meet this ignorant prejudice, which is largely the product of malicious falsehoods, promulgated by refracting jewelers, and designed to serve their own selfish ends, and by challenging, disarm it. Somebody would be sure to be hurt by such a course of procedure, but it is quite certain not to be either the opthalmologist or his patient.

[ED. THE REFRACTIONIST.

The Refractionist.

A Journal of Practical Ophthalmology.

EDITORS:
FRANCIS F. WHITTIER, M. D., 218 Boylston Street, Boston.
MAURICE F. PILGRIM, 472 Congress Street, Portland.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.

A Happy New Year. The Refractionist's Platform for 1896.

The Refractionist would have been glad if it could have met its readers promptly on January 1st with its "Happy New Year" salutation, but though necessarily delayed, the greeting is none the less cordial.

The "New Year" opens most auspiciously for the cause of scientific refraction, to which The Refractionist is committed. Certainly there has never before been a time when the subject has received so much serious thought as now. Letters commending the position assumed by this journal towards the refracting opticians have continued to pour in upon us with gratifying frequency. Nor have they come from the oculists exclusively. Physicians in general and other lines of practice, clergymen and laymen alike have united in commending the stand we have taken in defense of scientific refraction. We use the term "*scientific* refraction" advisedly, because we contend that medically trained men *only* are capable of doing such work properly, and that only such should attempt or *be permitted* to attempt it. Not the least among the gratifying signs of the times is the interest that has been taken within the past year in this matter by ophthalmologists who have hitherto been unconcerned and indifferent. That the spirit of reform is in the air is attested by the discussions which have taken place in various medical societies within the last few months, and in some of which action looking to the cure of the evils of "refracting opticians" by legislative enactment has been formally determined upon. It is only a question of time when the refracting optician-jeweler must go to meet the peripatetic quack and advertising medical mountebank.

Let each oculist, each physician, resolve at the threshold of this new year to become an active contributor to this endeavor. Success means the prosecution of a vigorous "Campaign of Education." Wrongs in order to be righted, must first be comprehended. To such work each of us can and ought to contribute the full measure of our individual influence. The history of past medical legislation is full of encourage-

ment and hope for the future. Five years ago only one of the six New England states had a medical registration law. Anybody was privileged in Maine or Massachusetts to drop the shoemaker's hammer or leave the plow and proceed, without a day's preparation, to practice medicine. Today that privilege can be only procured in the two states above named, by a successful examination passed before a State board. Moreover, in every New England state (excepting, possibly, New Hampshire,) legislation has been enacted that makes the attempt to practice medicine, without the previous registration of a diploma issued by a legally chartered and duly recognized medical college, a crime. It is, indeed, a great achievement, and all brought about within five years. Why shall not the next five years witness as great or even greater triumphs?

Like all great efforts for reform, we are not working for ourselves essentially or alone. Oculists in most instances are appreciated and liberally patronized now by the intelligence of the community. But the eye-sight and, consequently, the happiness, of thousands of people annually depend upon the earnestness of our efforts. We must not permit any imputation of self-interest or carping criticism to stand between us and our duty to the public.

In offering its New Year greetings, The Refractionist will endeavor to merit present and future favor by providing original and selected matter interesting and helpful to the oculist in his refraction work. It will also endeavor and hope to aid the busy physician in general practice, by bringing to his notice in the briefest possible space an epitome of the latest and best thought respecting the influence of eye-strain upon the general health and the oftentimes remote bodily disorders which it frequently occasions by reflex action.

It will also continue to advocate the examination of the eyes of all children entering the public schools for the first time, and continue its endeavors in helping to create a public sentiment that must ultimately make such examinations as compulsory as vaccination now is.

This, then, is our platform for the year 1896.

1st. The dissemination of knowledge pertaining to the science and practice of refraction, and the relationship which uncorrected refraction errors sustains to the general health.

2d. Protection of the eye-sight of those who are too young to protect themselves—the youth of the country—by early and systematic examination of the eyes of every child entering for the first time the public school; and

3d. Protection to the eye-sight of adults by waging a war of extermination against the optical pretenders and tinkerers, whom many through

indifference or ignorance now encourage and support by their confidence and patronage, and at the same time endeavor to show them the error and folly of their ways.

The successful prosecution of this proposed campaign depends largely upon individual effort. The Refractionist will earnestly strive to do its duty. Will you do yours?

* * *

Inconsistent Medical Legislation.

The incongruity of legislation regulating the practice of medicine in many of the States cannot be better illustrated than by quoting from a letter recently received from a correspondent living and practicing in one of the cities of Pennsylvania. He says:

"I have been practicing ophthalmology for nearly fifteen years, after having first attended long courses at Will's Eye and Pennsylvania hospitals at Philadelphia as well as in Berlin, Germany, and had a term of service at St. Mary's Hospital, London, England, under Critchett and Juler. And yet on the same street, only a few doors from my office, is a so-called optician who graduated after a few days' study (?) at * ——— possibly, *who has the same right to practice that I have*, and who is pretending to do so."

And this in the State of Pennsylvania, whose devotion to a higher standard of medical education is so great that it declines to recognize the diplomas of its own legally chartered and excellent medical colleges as conferring the right to practice within its borders, but exacts examination before its Board of Examiners of every applicant for a license to practice! By what strange process of reasoning or non-reasoning does the State insist upon rigidly testing the qualifications of one man whom a reputable medical college deems competent and who desires to practice medicine and to do so in an honorable, decent and ethical manner, and yet permits another man without any pretense to medical education (or any other kind, frequently,) to flaunt his flaming advertisements in people's faces and pretend to practice ophthalmology without imposing upon him any conditions whatever? It is estimated that at least seventy-five per cent of an oculist's work consists in refraction, in whole or in part. The qualified oculist, who is always a physician, does refraction work. So does the uneducated optical quack, or pretends to do so. What consistency can be claimed for a law that discriminates against the educated physician by compelling him to submit

*A "Cheap John" refracting optical house in Philadelphia who distribute their agents in the smaller towns placarding "Eyes examined free," with the evident intent of selling as many pairs of glasses as possible.

his claim to a state board of examiners before he has permission to quietly, decently and legally practice ophthalmology, and yet permits the ignorant and brazen quack to issue his advertisements and attempt to do seventy-five per cent of precisely the same kind of work without satisfying any state requirement whatever?

The practical effect of such laws is to give free rein to incompetency while hedging about competency with exacting restrictions and limitations. Obviously such laws either exact too little or too much.

* * *

Education. Reprints. Attention is again invited to the article which appeared in the October and November numbers of The Refractionist, entitled "Shall Opticians Attempt to Fit Glasses?" We are prepared to furnish reprints (22 pages) of this valuable article to those who wish them for office distribution, at $3.00 per 100 copies, which barely covers the cost of paper and printing. We are anxious that this very complete and absolutely unanswerable reply to the oft-repeated and oftener *thought* than uttered question, "Why shall not opticians attempt to fit glasses," may have the widest possible publicity. We believe that any fair-minded layman, even though biased in favor of the refracting optician, cannot carefully read this article without becoming convinced of the dangerousness of permitting any one not medically trained, to meddle with the eye. The ophthalmological world is in need of just such converts as it is believed this valuable paper is calculated to make.

Oculists could not better serve a common cause and at the same time protect their own business than by freely distributing this valuable reprint among the laity. We are already having duplicate orders from physicians. Have you sent in your first order?

* * *

No Controversy. In the current number of the *Optical Journal* is an abortion of an attempt to answer, "Shall Opticians Attempt to Fit Glasses?" The writer, while boasting of filling 150,000 prescriptions for oculists during the past ten years, does not have courage enough to sign his article with his own name, for fear doubtless, that he will lose some of the business of those he maligns. Dr. Pilgrim wrote his article for physicians, not for mechanics, and it is not in the province of this journal to enter into a controversy with such an illiterate, uncultivated and opinionated person, whose arguments are as pointless as his syntax is barbarous. This attitude will be maintained in reference to any future diatribes emanating from a similar source.

Communication.

ALLENTOWN, PA., January 3, 1896.

Editor Refractionist: —

I read with a great deal of interest the valuable contribution by Dr. Maurice F. Pilgrim, "Should Opticians Attempt to Fit Glasses." It is high time that the general practitioner should become educated on the subject of refraction, and recommend his eye cases to the oculist instead of these miserable pretenders, who assume for themselves high-sounding titles,—"Scientific Opticians," "Master in Optics," "Graduate Opticians," "Professor." They are born of mendacity and bear the stamp of absurdity, and palm off their pretended knowledge of the eye upon an unsuspecting public, and how often have we found, when too late, that irreparable damage has been done to the eyes of patents by these miserable optical mountebanks.

* * * * * * * * * *

In the *Philadelphia Polyclinic* of Nov. 9, 1895, Dr. Jno. F. Carpenter, Jr., says, "Stringent laws should be enacted to protect the patients and punish the man who unlawfully attempts to practice opthalmology, without the proper qualifications as represented by the possession of a medical degree." If such laws were enacted, the medical profession would be enabled to have these "two to four-week graduates in optics" pay the penalty for their numerous crimes. They might then realize how much gall it takes to experiment upon the eyes of an unsuspecting public. That the opticians are fearing legislation in this direction is quite evident from an article published in a "non medical" optical journal, published in New York city. The article was headed, "An Appeal to all Opticians of America." The writer dissects Dr. Carpenter for the foregoing statement in the *Polyclinic*, as well as regular opthalmological competitors, who are looking forward for legislation to make it a crime for opticians who have not the necessary qualifications and cannot attach M. D. to their names to attempt refraction work. Of course, these deluded creatures imagine they can refract without any anatomical, physiological or pathological knowledge, and from personal knowledge I know that nine-tenths do not understand the use of the opthalmoscope, or what they should see if they did look into an eye. Should we as oculists or physicians shut our eyes to such gross ignorance? No! Let us be up and doing, and through the mandate of the law protect the public; then the work will fall into the channels where it properly belongs, the abuses now existing will be controlled, and the unscientific cry of the quack spectacle venders ("two-week graduate opticians") will be heard no more in the land.

G. T. Fox, M. D.

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. FEBRUARY, 1896. NO. 11.

PRACTICAL RETINOSCOPY.

BY C. W. HAWLEY, M. D., CHICAGO, ILL.

[*Continued from December and January numbers.*]

In the January number we worked out in minute detail a difficult case of mixed astigmatism, so that the process might be seen thoroughly; there remains to be considered hypermetropia, myopia, and simple and compound astigmatism. Certain deductions might be drawn from the one case covering nearly every form of work, but I am aware that what may seem plain to one acquainted with retinoscopy may be very obscure to an amateur; so will proceed to work out as briefly as possible each of the other different forms of ametropia, and follow with some general conclusions.

(I.) Hypermetropia in both eyes.

This case shows another very serious eye trouble, muscular insufficiency, exophoria of 8° and hyperphoria of 7°. It was towards alleviating this that I directed my attention; but before doing so, the refraction was worked out carefully, which should always be done in cases of muscular trouble, as often the latter will disappear when the former is cared for.

On examining the patient as before directed, shadows are seen bounding the image of the light of about the same density and moving across the field with the same rapidity, and against the rotation of the mirror. The conclusion drawn from this is that we are to deal with a case of hypermetropia of low degree. Placing before the eye a + 1.75 D. spherical lens, and rotating the mirror about the vertical and horizontal axes, we discover that the shadows move alike, but with the rotation instead of against as before, indicating an over-correction. Replacing this lens with one of + 1.50 D. spherical, we find the shadows have disappeared in all directions. I am sure I am dealing with a case lacking astigmatic error, as one of so small amount as 0.25 D. would show shadows. The

left eye responds to the same test, showing that both eyes are alike. Now, following the rule laid down before, we subtract + 1.00 D. spherical from each, and have as our result + 0.50 D. spherical for each eye. This being treated by the chart test proves to be correct.

(II.) Myopia in both eyes.

Preparing the patient as before, and illuminating the right pupillary space, we find rather dense shadows moving evenly in all directions with the mirror movements. Placing a — 2.00 D. spherical before the eye, the shadows are decreased in density, and move more slowly with the mirror; so I put up a — 3.00 D. spherical in place of the other, and now no shadows are seen in any direction — that is, we are just at the turning point. To make sure, we try — 3.50 D. spherical, and the meridians are all over-corrected. By a similar process — 7.00 D. spherical is obtained for the left eye.

Now, remembering that we must subtract + 1.00 D. spherical from these results, the correcting lenses become R. E. — 4.00 D. and L. E. — 8.00 D., with which my patient can read 6/6 and 6/12 respectively. No other combination either way from this seems as comfortable, hence this is ordered.

There remain to be dealt with the various forms of astigmatism. The first treated of will be simple and compound hypermetropic astigmatism.

On examining the pupillary area of the right eye of the patient in the chair, we discover shadows traveling against the mirror movements, the one in the horizontal axis being more dense and rapid in movement than the one in the vertical; so we will place a lens in the frame of + 1.25 D. spherical, and find that the shadows in the vertical direction have disappeared, but the other shadows still appear moving against as before, only much less dense and more slowly. We judge by this that there remains but very little of the error uncorrected, and place a + 0.25 D. cylinder axis vertical, which is sufficient, and now all the shadows have disappeared, and our retinoscopy equation is + 1.25 D. spherical $\bar{c}$ +0.25 D. cylinder axis about 90°.

In the left eye I find similar shadows, but on putting up + 1.25 D. spherical they move with the rotation in the vertical axis, and consequently I drop down to + 1.00 D. spherical, when they disappear from this axis, but still move against in the one at right angles. A + 0.50 D. cylinder axis vertical corrects this meridian, and our retinoscopy equation is + 1.00 D. spherical $\bar{c}$ + 0.50 D. cylinder axis about 90°, subtracting + 1.00 D. spherical from both equations, and they will read R. E. + 0.25 D. spherical $\bar{c}$ + 0.25 D. cylinder axis about 90°, L. E. + 0.50 D. cylin-

der axis about 90°. Trying these before our chart, we find them suitable for this patient.

The last forms of astigmatism we shall deal with are simple and compound myopic astigmatism; and we will take a case similar to the above.

We will go directly at the dark-room work. In the vertical meridian there seems to be a slight shadow moving against the rotation, and one more decided in the opposite; and we come to the conclusion that we are dealing with either a mixed, a simple, or compound astigmatism. We will try + 1.00 D. spherical, and we see the shadows disappear in the horizontal meridian, but appear moving with, in the vertical, showing an over-correction in this; but by adding — 0.50 D. cylinder axis vertical this shadow also vanishes, and both meridians are correct, and this is our equation, + 1.00 D. spherical $\bar{c}$ — 0.50 D. cylinder about 90°.

Examining the left eye in a similar manner, no shadows are seen in the vertical axis, but a slight one moving against in the horizontal. A + 0.50 D. cylinder axis 90° corrects this axis, and as we must take + 1.00 D. spherical from each meridian, our equation practically becomes — 1.00 D. axis 180° $\bar{c}$ — 0.50 axis 90°; or simplifying, we will have — 0.50 D. spherical $\bar{c}$ — 0.50 D. cylinder axis 180°. No shadows in a meridian means — 1.00 D. in that meridian. Our corrected equation then stands R. E. — 0.50 D. cylinder axis 90°, L. E. — 0.50 D. spherical $\bar{c}$ — 0.50 D. cylinder axis 180°. Testing this by the chart, we find it to be correct, and is worn with comfort.

This completes the demonstrations of the common forms of errors of refraction one meets in practice. Some puzzling cases appear at times, which do not come within the limits of this paper. A thorough mastery of the foregoing will enable one to solve them. This paper was not begun with the intention of making a complete exposition of retinoscopy.

Looking back over the demonstrations we can arrive at the following conclusions:—To do the work the patient must have a dilated pupil and a paralyzed ciliary muscle, and in the majority of cases this may be accomplished by using discs of homatropine and cocaine (alkaloids). The worker must possess a plain or concave mirror of about 22 cm. focus, a trial frame and lenses, charts, a dark room, and good light.

The deductions drawn from the shadows are the following: If they are of the same density, and move across the field with equal rapidity, we are dealing with either emmetropia, hypermetropia, or myopia.

If the shadows are of different density, and move across the field with different rapidity, the case is one of astigmatism.

If the shadows disappear from one meridian with the use of + 1.00 D. spherical, and are still visible in the other at right angles to this, and

moving against the rotation of the mirror, the case is one of hypermetropic astigmatism; but if the shadow in this axis is moving with the mirror it is one of myopic astigmatism.

If the shadows disappear from the weaker meridian by the use of a spherical lens greater than + 1.00 D., and are still visible moving against in the other, it is a case of compound hypermetropic astigmatism.

If the shadows disappear from the weaker meridian by using a spherical less than + 1.00 D., and are still seen moving against in the other, it is a case of mixed astigmatism if the latter meridian takes a lens of over + 1.00 D. to correct it.

If the shadows disappear by using different lenses of less than + 1.00 D., or by using different concave lenses, the case is one of compound myopic astigmatism.

Always correct the meridian nearest the emmetropic condition, first by a spherical lens, then add a cylinder to correct the other, and subtracting + 1.00 D. spherical from the result, the lenses correcting the refractive error should be known.

Retinoscopy gives the axis only approximately. If the true axis is near the vertical, the stronger meridian will show in the horizontal, but if the axis is near 45° or 135° it may show in the horizontal, though generally in the vertical.

Adjust your distance from the patient, so that the image reflected from the retina shall be clear cut, which is about arm's length, varying with different patients.

70 State St.

EVOLUTION OR REVOLUTION — WHICH ?

FRANCIS F. WHITTIER, A. M., M. D., Medical Sup't Boston Baptist Hospital.

The opposition to the endeavor of the Massachusetts Charitable Eye and Ear Infirmary (a private charity), to obtain an appropriation of $100,000 from the State, for the erection of a new building, on the plea that the character of the work it does should entitle it to State aid, is well voiced in a statement recently received from a physician, "How long the great mass of the profession will stand this grabbing of a few, I do not know."

Medical pauperism is an outgrowth of the present century, a parasite attached to the modern hospital and dispensary.

Originating in connection with religious work, the nearest trace of the original hospitable idea, meets the traveller in the Alps when he reaches .rnard. The rich and the poor were treated alike in the old church hospitals or monastic houses, each giving in return what he could. In course of time the original idea was divided between the hotel and the hospital, two kindred words. The entertaining of guests to the former, and the care of the sick to the latter. It was in this division, and in retaining only one side of the monastic idea,— namely, the treatment of the sick regardless of their ability to pay,—that has arisen one of the greatest abuses of modern times.

What was possible for the clergy (knowing most of the poor) to do in a country sparsely settled when transferred to later times, and to densely populated cities, has proved decidedly injurious.

After the Reformation, with the rapid increase of hospitals, a new impetus was given to medical studies, and instruction began to change from the didactic to the clinical. Then hospitals became the centers for instruction, and in many cases hospitals came to have their colleges attached. In fact, to promote medical education and aid the deserving poor should be the main objects for the existence of the hospitals and dispensaries of the present day; but, alas! such is not the case.

The ethical idea of the medical profession, is that only the scientific side of medicine should engage our minds, which may account for the latent (possibly, manifest financial) failure of so many physicians. The business side of the profession is, unfortunate as it may be, a practical task that interests the major part of the young men of the profession, especially those anxious to establish a city practice.

The 19th century stands by itself, not more in inventions and discoveries than in the number of institutions for relieving suffering

that have been instituted in the larger centers of the world. Founded on charity and intended for those deserving help, many of them have outgrown their primary functions, and become breeding places for paupers, and tend to demoralize and impoverish the profession.

Is it not more honorable for a physician to recommend the Keeley cure than to go into a clinic conducted in the name of charity, and treat 60 patients in 60 minutes, or run off 125 in a morning. Where is the lack of physicians that such work need be done. People have ideas in refference to some of our institutions which are radically wrong, and which should be controverted by the medical profession. Because an institution is called an infirmary or hospital, it is no sign that every one or any one who pays taxes should apply for free treatment on that pretext alone. That they do apply is a truism, and that too many are admitted who are able to pay a physician's fee, is too well known by every physician.

Again, our so-called State institutions, simply because they have the name of the State attached, although really private, are flocked to by people from all parts of the State who are able to pay.

One of the Vice-Presidents of the American Medical Association, in answer to a circular letter of June 23, 1895, says:—

"My Dear Doctor:—Your circular note of the 23d ult., relative to the best method to remedy the present abuse of medical and surgical charity, etc., was duly received. I have delayed answering that I might have time to consider the subject from different standpoints from which it may be viewed. The question presented for our consideration involves many principles that underlie our social fabric, and is therefore one not of easy practical solution. I am willing, nevertheless, to express the individual views I have long entertained respecting the administering of such charity.

"The bringing about of the reform you speak of can only be secured by legislative enactment. There should be passed one general law to the effect that a dispensing officer of an institution should transmit to the overseers of the city or the town an accurate record of all charity dispensed, giving the names, addresses, and other necessary data. It should then become the duty of the assessors of municipal taxes to examine such returns, and if they find that parties who have been able to care for themselves have been recipients of such aid, it should be the duty of the municipal tax officers to include such amounts in the tax bills of such unworthy recipients; this to be collected and paid over for the benefit of the city or the town from which the offending party may hail. The chief objection to this method of procedure, it seems to me, will come, either directly or indirectly, from those who appear desirous of furnishing large facilities to students of medicine, or from those who are desirous of making a record. Here, again, we shall be confronted with a great social problem.

"In answer to this, it should be remarked that it should always be the policy of the Commonwealth *not* to allow one class of her citizens to become paupers that another class may seemingly be advanced."

A well-known oculist of New York says :—

"In reply to your query, 'What, in your opinion, is the best method of correcting the abuse of medical and surgical charity, etc.,' allow me to state a few plain thoughts, based upon the result of nearly twenty years' experience in hospital and dispensary practice. If three-fourths of all the dispensaries were either closed, torn down or burnt up, humanity would be better, and no poor, deserving patient would need for proper care. Further, I maintain, were no dispensary system in existence, the deserving poor would not be neglected or suffer in any way.

"So much has it become a habit of thought among the working classes and well-to-do mechanics in all large cities, that the first thing when sickness comes, is to send for the dispensary visiting physician, or to send the patient to the place itself. This same family would be insulted should a load of coal be dumped at their door by the 'poormaster' of the city. We have frequently seen those with an income of one hundred dollars a month plead the poverty act. My experience has taught me that, in New York city, all the special hospitals are crowded with improper objects of charity.

"Three-fourths of the patients at the principal eye and ear hospitals of our city can afford to pay a fee—and that a good-sized one—of several dollars. This is based on questioning and fact. The way to correct this alone is to make every applicant show a credential from an accredited officer of the law, as an alderman, a police precinct commander or some such person. By in this way making it hard and disagreeable to obtain these permits, only those who were proper objects would seek admission. Patients should also be restricted to the city in which the dispensary is placed, and no non-resident should be admitted. The strict enforcement of the rule, 'For the poor only,' should be honestly carried out, and not as now, by the simple asking, by the superintendent or matron, of the question, 'Are you a proper object,' to which all invariably give the affirmative answer; deliberately lying, doing themselves moral harm, besides pauperizing themselves."

Where is the physician who has not had patients (not poor, but well-to-do, yes, amply able) report to him a visit to some of these institutions where they have been advised to enter for treatment, either free, or for a small sum?

How to check this tendency, should be the care of every physician. The medical atmosphere of today is not that of fifty years ago. With increase in population in our large cities, have come new phases of our work. We are simply falling in the wake of many of the cities of the old world, where the question of medical abuse has been gone over and over again in print.

For new institutions to undertake to make radical changes would be suicidal. It remains with the older institutions to inaugurate the work.

When will they begin? We fear never, for it is policy for the few monopolists to continue under the present régime.

All our medical institutions, public and private, should be required to deposit a fund similar to insurance companies and banking institutions before beginning business, and should be under the control of a board of commissioners. All appointments should be made after a competitive examination and in order of merit.

No term of service should continue more than three years unless gained again by competition. No one should be eligible for examination without at least three years practice after graduation; all appointments to carry with them a fixed salary, and no physician to have any practice outside the hospital or dispensary while holding such appointment.

No person should be admitted for *free* treatment the maximum value of whose belongings exceed a certain amount, we will say $300.

In case of families, no member should be admitted the head of which receives a stated amount per week, for instance, $12.00. In cases of widows, working girls, etc., a fixed limit should be placed.

Any person to be admitted, provided regular physicians' fees are paid with board, etc.

At the entrance of every hospital and dispensary rigid examination should be made in reference to the financial condition of the applicant, and any misrepresentation or deception should be punished accordingly.

A pauper list should be established in every institution, and yearly compilation should be made for general institutional work.

Our large cities should be divided into districts and a medical inspector appointed, as before mentioned, to investigate doubtful cases. All emergency cases should be treated at once from a humanitarian standpoint. In this way 60 per cent of those who are treated at dispensaries and hospitals would find their proper place in the physician's office. The physician would have more self-respect and not be forced to so many underhanded ways of securing a livelihood; there would be less need of ethical bickerings in the profession; the few physicians who hold the monopoly of the best positions in our leading institutions, simply by the apathy of the rest of the profession, would have to give others a chance; and the masses would not be educated in medical pauperism.

We have no objections to the State founding institutions wholly under the care of the State, where eye and ear diseases may be treated, but the physicians in charge should have a stated salary as in our insane and other institutions, and not enter the field as competitors with other physicians till their connection is severed with such institutions.

Selections.

Eye-Strain A Cause of Nocturnal Enuresis.

On November 12, 1891, a little girl, M. S., nine years of age, a "nervous child," with headache, no appetite for breakfast, etc., was brought to me for treatment. The mother stated that the child slept very poorly, having frequent night-terrors, was somnambulistic, and had "other troubles," the nature of which I did not exactly learn until subsequently. Under a mydriatic I found the following remarkable error of refraction:

R. + sph. 0.75 D. ⊃ + cyl. 5.00 D. ax. 100° = 20/70.

L. + sph. 1.00 D. ⊃ + cyl. 5.00 D. ax. 85° = 20/70.

After wearing the glasses I then prescribed, the visual acuteness became in a short time normal in the right eye, but it was a year or more before I succeeded by the "blinder-treatment" in bringing that of the left eye to normality. The headaches soon passed away after getting glasses, likewise the nightmare, and the appetite became good. Within a year the child was as robust and hearty as could be desired. At this time I first learned that for years prior to consulting me the child had been afflicted with nightly enuresis, for which all treatment had been in vain. This had continued up to the day of instilling the mydriatic and applying glasses, but from that day it has never occurred once since.

The second case was not cured so suddenly, as the circumstances, age of the patient, continuance of the malady, etc., were not by any means so favorable. The boy was fourteen years old, had been afflicted with frontal headache "all his life," and had also had "fainting spells" for a number of years. There had also been a frightful nasal catarrh. Many physicians and surgeons had been consulted for nocturnal enuresis that had persisted from infancy, but all treatments and operations had been without effect. I found a high degree of compound hyperopic astigmatism and hyperphoria. After prescribing glasses the headache disappeared at once, and a partial ptosis of the left lid also disappeared. The wetting of the bed did not stop immediately, but did do so "very soon afterward." The patient disappeared from view, and it is only lately that I have learned that the enuresis stopped soon after getting glasses, and has not appeared since. The parents now ascribe the cure to the glasses, and I agree with them. As general treatment of the boy's health was also instituted by me, a legitimate suggestion might arise that the cure of the enuresis might have been due to that instead of to the stoppage of eye-strain. General treatment, however, had been previously thoroughly tried, but in vain until the ocular treatment was added.

Taken in conjunction with other cases, I think that the reflex had its source in the eyes.

Another little girl, G. M., eight years of age, was brought to me December 14, 1889, with a history of headaches and or chorea during the preceding four years. The choreic affection was limited to the face and to the hands and feet. She was a very restless child, the hands and feet jerking and moving all the time, even in sleep, and "she talked in her sleep all night." Nocturnal enuresis had likewise existed for four years, and occurred every night. In this case there was difficulty in getting the child to wear glasses correcting the anisometropia. The chorea and other symptoms gradually ceased during the first month or two, but resumed again with their old intensity which she "lost her glasses," and was without them for two months. In June, six months after the first visit, I again took the case up, and prescribed other glasses, and they were now worn continuously. On October 2, 1892, with great patience, I succeeded in getting a still more accurate correction of the error of refraction (compound hyperopic astigmatism), a task of the utmost difficulty. But long prior to this date the enuresis, chorea, night-terrors, etc., had entirely disappeared. The nervous system had been so profoundly deranged that a sudden cure was not to be expected, but that the eye-strain bore a causal relation to the symptoms of enuresis and chorea, I have no doubt.

On March 12, 1894, a little girl, M. S., six years of age, was brought with a history of great nervousness, kicking about and crying out in her sleep, headaches, painful eyes, etc., and with nightly enuresis. From the day glasses were give her these symptoms disappeared "as if by magic."

On October 13, 1894, Dr. O. P. Rex sent me a child of ten years, H. S., who had headache a great deal, and painful eyes. I did not at this time know that the child had been afflicted with persistent nocturnal enuresis for years, for which all treatment had been in vain. I found the following vicious error of refraction:

R. and L. + sph. 4.50 D. ⊃ + cyl. 2.00 D. ax. 90°.

This gave her only 20/100 visual acuteness, which, however, soon improved by wearing the glasses, until one eye had normal acuity in a few weeks, and the other by the blinder-treatment is steadily gaining. Headache, etc., at once disappeared, and from the day of applying the glasses the child never "wet the bed" again.

Besides these cases I have had others in which I am moderately certain that the eyes were the ultimate or a contributing cause of the affection under discussion, but in which the cure was either more slow or the etiology more suspicious, and I do not include them in this report.—*Geo. M. Gould, A. M., M. D., Philadelphia, Pa., in the Medical News of December 15, 1894.*

Communications.

146 East 37th St., N. Y. C.

Dr. Francis F. Whittier, Editor.

Dear Doctor :—In the December issue of The Refractionist I noticed an article by Dr. C. W. Dodd, copied from the *Cincinnati Lancet-Clinic*, and which also appeared in the *Ophthalmic Record* of December, 1895, entitled "Astigmatism of 28 D." I therefore write to Dr. Dodd, through you as editor of a journal devoted to Refraction, for an explanation as to how these results were obtained, and furthermore his reasons for ordering crossed cylinders.

As Dr. Dodd states that "this case is a strong endorsement of the value of the keratometer," also that all other objective tests would have been more than useless; and as the case has been placed on record by both your journal and the *Record*, I think we should have some more explicit reasons for his conclusions.

I have used Javal's ophthalmometer for several years, and have endeavored to explain how the instrument should be used, but I cannot understand how we can illustrate and prove such an extreme degree of astigmatism. So it will interest myself, and perhaps many other readers of your excellent journal, to know how the Doctor arrived at his conclusions.

I suppose that the Doctor has possibly taken his measurements from the small figures on the left-hand side of the large disc; and if so, may I ask at what position did he place the parallelogram of the mires? Did he move it to a corresponding point to the right?—that is, when the steps marked the position of 60 D. did he also place the parallelogram outward to the right (facing the disc)? If so, then his estimation of the amount of astigmatism is correct; but he does not seem to have moved the parallelogram, for he states that "this was a departure from the normal average of 17 D. in excess in the horizontal, and 11 D. deficiency in the vertical," showing conclusively that he must place the normal radius of curvature at 8.1 mm. (while Javal seems to calculate 8.4 mm.). To explain this more fully, an object 20 cm. in diameter will form an image of 3 mm. in diameter on a convex mirror, whose radius of curvature is 8.4 mm., placed at 28 cm. from the object.

From the above let us see what the ophthalmometer will show, provided we do not move the position of the parallelogram. In the horizontal meridian I judge that the mires were brought together until they would just touch, and if so, the steps would be at the position marked 30 on the arc, showing a radius of curvature in that meridian of 6.75 mm.

At that position, we have the diameter of an object 25 cm., which will form an image on the cornea with a radius of 6.75 mm. equal to 3 mm., that is exactly doubled, and made tangent by the prism of the objective.

Now let us see what the same conditions will produce in the vertical meridian. We find that the position of the step must have been at the point marked 16 on the arc, giving us a radius of curvature of 9.4 mm., and showing a difference in the two radii of 2.65 mm. Therefore, if my suppositions in reference to the position of the mires be correct, let us see what was the actual condition of this extremely interesting case at the time of the examination.

If we take the vertical meridian first, we will find that when the steps are at the position marked 16 on the arc, we have a radius of curvature equal to 9.4 mm., and as the size of the object is only 18 cm., the refractive power of the dioptric apparatus in that meridian is equal, not to 32 D., but to 36 D.

The same rule applies to the horizontal meridian, where we find the refractive power of the dioptric apparatus not 60 D., but only 50 D., and consequently the difference between the two is only 14 D. The above result is verified by reading the numbers of the dioptrics of astigmatism by the position of the steps on the arc in the two meridians, as shown by the difference between 16 for the vertical and 30 for the horizontal.

If my reading of this most valued instrument is correct, then we have a case of astigmatism of only 14 D. instead of 28 D., and hence I cannot understand the reasons for ordering the strong-crossed cylinders, as stated in the article mentioned, when perhaps toric lenses would have improved the vision still more.

It is not my intention in the above to criticise Dr. Dodd's work, but simply to show that I have a deep interest in all refractive work, and also in the estimation of astigmatism by the ophthalmometer.

In conclusion, let me illustrate an interesting case which came up in my practice lately:— L. E. V. = fingers at 4 ft. with — 1/5 ax. 90° = $\frac{10}{200}$, horizontal radius of curvature 7.2 mm., vertical 8.5 mm., showing 7.5 D. of astigmatism. I operated on this case for simple, chronic glaucoma, doing a broad iridectomy directly outward. Five weeks after the operation we find the horizontal radius of curvature 7.555 mm., vertical 8.25 mm., showing only 3.75 D. of astigmatism, a reduction of 3.78 D. from the astigmatism before the operation, and V = $\frac{20}{70}$ + with — 1/11 ⊂ — 1/9 c. axis 75°. The change in the curvature of the cornea in this case was very interesting, and was the object I endeavored to produce by making the iridectomy outward. Respectfully,

FRANCIS VALK.

Calamity Howlers.

The charge has repeatedly been made and published by opticians and jewelers since The Refractionist began its crusade against their tinkering with refraction work, that the protest emanates from and is confined to the ophthalmologists having small clienteles. It has been asserted that not only have none of the better known ophthalmologists protested against their practices, but that they either affirmatively endorse jewelers and others attempting "*ordinary cases of refraction*," or are indifferent to and passive with reference to it. Those who have protested have been characterized as "calamity howlers," and are said to be acting without the countenance and support of the men eminent in ophthalmology.

As showing the baselessness of the assertion alluded to above, we have permission to quote an extract from a private letter, recently received from a gentleman who is perhaps as well and favorably known to ophthalmologists abroad as in this country. Certainly no man has a better claim to speak for ophthalmologists generally. He says:

"PHILADELPHIA, Feb. 3, 1896.

"I am sure that the refractionist work done by the opticians who hold so-called diplomas from all sorts of schools, is bringing ophthalmology into great disrepute. I am of the opinion that the prescribing of glasses by other than registered physicians should by legal enactment be made a misdemeanor subject to a fine. They use eye-drops and call themselves doctors, etc., etc., and do very bad work at best. I am fully in sympathy with any wise course that will put a stop to it. This would soon be done were it not for the support they receive from so many physicians, who not only go to them for advice but send their patients also for glasses.

"It is a great evil. I am continually seeing patients with serious forms of ocular disease, who have pinned their faith to these charlatans until too late to receive help from scientific treatment.

* * * * * * * * *

"SAMUEL D. RISLEY."

Signs of the times.

The following from a well-known oculist in Washington shows the increasing tendency of physicians to adjust their own work:

"————, January, 1896.

"I am beginning to furnish my patients with their glasses, and would like to have as much light on the subject as possible, i. e., as to the best methods of fitting the frames, etc., etc. Will you kindly advise me? I should think that a page set apart for such suggestions in THE REFRACTIONIST, and all invited to contribute, would be of great value to all concerned. Wishing you success and prosperity, I am,

"Yours fraternally, ————."

[In subsequent issues we shall endeavor to have some helpful suggestions in this part of oculist's work. Correspondence is invited.]

The Refractionist.

A Journal of Practical Ophthalmology.

EDITORS:
FRANCIS F. WHITTIER, M. D., 218 Boylston Street, Boston.
MAURICE F. PILGRIM, 472 Congress Street, Portland.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.

Asthenopia. While accurate corroboratory statistics are wanting, no systematic compilation having been undertaken so far as we are now aware, it is our belief that asthenopia, like myopia, is steadily increasing year by year. This belief is strengthened by the experience of the past few years, both in hospital and private practice. The causes of this condition, while numerous, admit of easy analysis. Perhaps the following are the more marked common causes: *i. e.*, use of the eyes at work proper in itself, but continued too many hours per diem; work that is improper *per se* and to which nature never intended the eyes to be subjected; insufficient and bad illumination; the conscious need of glasses, but unwillingness to even submit to an examination until the eyes require absolute and prolonged rest even more than glasses; the wearing of *improper* glasses (selected either by the patient or by some one in trade whose business is that of vending wares), which are usually an over-correction of one meridian, whereas the eye requires, as in astigmatism, *equalization* rather than *magnification.* Whatever the cause, the condition is a most unhappy one, not alone for the patient, but also for the oculist, and hope for speedy relief is rather unpromising for both unless the sufferer is considerate enough to "change physicians" frequently.

In a future number of The Refractionist we propose to discuss the subject of asthenopia more in detail, and with special reference to the relationship which it is believed abduction and adduction sustains thereto. Failure to take into account as one of the determining factors in writing our prescriptions, the muscular tone as disclosed by abduction and adduction tests is, in our belief, annually responsible for a good many thousand pairs of glasses which, while accurately correcting the ametropia, occasion so much discomfort that patients defiantly refuse to wear them. We cannot secure emmetropia in any case unless we at the same time make sure that we have orthophoria. That it is the patient's duty alike to himself and his oculist to wear the glasses ground in conformity to the prescription of the man whom he employed to determine the needs of his eyes, ought not to need affirmation.

But, alas! a large and growing element in every community who seek the oculist's consulting rooms will not do this if it involves much temporary discomfort. In dealing with this class of people — and every practitioner *must* deal with more or less of them — the following principles have been found to yield excellent results and are commended to our readers, viz.:

Proceeding upon the supposition that a determination of the condition of the ocular muscles forms a *never omitted* part of every eye examination, this is the procedure which has proven very satisfactory to the writer when dealing with the class of people above mentioned:

I. Where the refraction is hyperopic and adduction is weak, reduce the sphere, but give full cylindric correction;

II. Where weak adduction accompanies myopia, *fully* correct with — spheres as well as cylinders;

III. Where weak abduction is associated with hyperopia, always give full spherical and cylindric correction, and occasionally an over-spherical correction will do excellent service, *temporarily*;

IV. Where weak abduction is found in conjunction with tolerably high degree of myopia, the sphere should be markedly reduced.

As indicated above, this subject which is believed to be very important and should occupy a commanding place in the routine of refraction work, will receive fuller discussion in a future number of this journal.

* * *

Doubtful Axes.

A difficulty recently encountered, and which it is now proposed to describe, has been experienced in private practice at least a dozen times during the past year. It is an anomaly that, so far as we know, has thus far defied explanation or the formulation of an exact and satisfactory rule of procedure.

A. B. accepted by the subjective method, +0.75 cylinder, axis 60°, which gives 20-20ths vision. This lens and axis was accepted at the preliminary test. The next day, after obtaining full mydriasis with homatropine, patient required +1.37 cylinder, axis 90°, in order to obtain vision of 20-20ths. The cylinder placed at 60°, as required in the non-mydriatic test, not only failed to give clear vision, but reduced it to 20-35ths. The following day, after accommodative function had been fully re-established, patient insisted that the axis again be placed at 60°, which gave vision 20-20ths. Placing the axis at 90° now gave patient vision of only 20-40ths, and even that was blurred and somewhat uncertain. He reluctantly accepted mydriatic *strength* of cylinder,

+ 1.37 as against +0.75, but not the *axis*, insisting upon its being placed at 60°.

Now, where ought the axis of the correcting lens to be placed? This query becomes an exceedingly practical one because the oculist must answer it correctly or else incur the danger of adding a dissatisfied patient to the totality of his already superabundant perplexities. If the axis is placed at 60°, it amounts substantially to a manifest correction; and of what practical avail was the mydriasis? If, on the other hand, it is insisted that the axis be put at 90°, as in the mydriatic test, of what utility will such procedure be if the cylinder so placed causes the patient such a headache that he flatly refuses to wear it? It is obvious that one of these axes must be wrong. Which is it?

The Javal and Shiotz ophthalmometer is a beautiful and ingenious piece of mechanism, that in about seven cases out of every ten, in my experience with it, gives accurately the degree and axis of the *corneal* astigmatism. That cannot be relied upon in this instance, however, for the obvious reason that we don't know in which group of cases our dilemma belongs, the seven or the three, as indicated above. Besides, part of the astigmatism *may* be lenticular where the ophthalmometer becomes by general consent, valueless.

What about skiascopy at this juncture? some one may very pertinently query, perhaps. Not every ophthalmologist is an expert skiascopist, while a considerable number express their disbelief in the accuracy of its disclosures. Without expressing at this time an opinion as to the value of skiascopy in refraction work, the question recurs, Where would the practitioner who relies exclusively upon the *subjective method* place the axis of the cylinder? That answered, the second query very pertinently follows: Why at the one rather than at the other axis? As this is a vexation that is liable any day to confront and harass any of us, especially those relying upon the subjective method (as many excellent ophthalmologists do), THE REFRACTIONIST invites the opinions of oculists upon this point. It will be glad thus to become the medium through which a consensus of ophthalmological opinion upon this important point may be reached and recorded.

THE REFRACTIONIST.

The Exponent of the Refraction World.

VOL. II. MARCH, 1896. NO. 12.

PRESBYOPIA.

By MAURICE F. PILGRIM, M. D., PORTLAND, ME.

NOTWITHSTANDING that the children of each generation have seen their fathers and mothers wear glasses when reading, sewing or doing other close work, the presbyopic period is ushered in upon them usually with mingled feelings of surprise and fear. They fear they are becoming blind. This not infrequently is quite as true of the educated and intelligent as of the ignorant classes in the community. Indeed, intellectual attainments do not seem to cut much of a figure in the apprehension of elementary optical principles. While many people realize that in the natural order of events they will come to need the aid of lenses in doing close work, the number who do not realize it in advance and are shocked when the necessity arrives, is very many times larger.

It would seem as though something useful respecting the anatomy and physiology of the organs of the human body and how properly to care for them, might find an appropriate place in the home or school instruction of the youth of the land. It would be infinitely better for the eyesight of the next generation if the children of the present were taught something about the care and use of their eyes. Certainly there would be less asthenopia in the next, if this generation came to understand clearly about presbyopia.

The public — not necessarily the uneducated class, either,—need to learn that presbyopia is a *natural* weakening of the power of the eye to accommodate itself to near objects consequent upon advancing age. People ought to know that it does not portend ill to their sight *per se*, except in so far as their ignorance and neglect at such period contribute to that end. Inasmuch as glasses have been worn ever since they were invented in the thirteenth century by Salvinnus Amatus, or Friar Bacon, it would seem that the prevailing misapprehension respecting their use in connection with presbyopia, was inexcusable. The plain fact is that a large proportion of the educated population of

the present day believe that if their sight for distance is perfect and their eyes free from disease, they ought never to need glasses, thus confounding presbyopia with ametropia. They do not know that the recession of the near point of vision—the *punctum proximum*—is the distinguishing mark of presbyopia and is as natural and physiological as birth and death. Not knowing this, thousands of eyes every year are strained and abused beyond the power of human art ever to perfectly remedy; for while presbyopia is a natural condition, it should also be remembered that it is also a time when nature throws out her danger-line and signals.

If the experience of ophthalmologists coincides with that of the writer, no part of his refraction work is as difficult and frequently as unsatisfactory as that of dealing with cases of presbyopia. Speaking broadly and yet guardedly, it is my opinion that the results in prescribing glasses for presbyopia will, if one's cases are carefully tabulated and the patients remain very long under observation, be found not only to be the most unsatisfactory in the whole routine of refraction work, but also the most harrassing to the practitioner. Given a liberal clientage of presbyopes of the *average* intelligence, faith and prepossession, and we shall have ordinarily such a condition of life for the ophthalmologist that he fain would welcome at times, banishment to the most dreary solitude as a punishment not only slight in comparison but as affording a genuine relief, the sweetness of which would beggar human language to adequately express.

It is my belief that these perplexities for the ophthalmologist are destined *under present conditions*, to multiply rather than diminish as time goes on. Certainly they are markedly worse now, so far as the writer's experience and observation serve him, than they were even five years ago.

When casting about for the reasons leading up to this unhappy condition of affairs, one need not look very far. The difficulty is complex, and proceeds from without and from within. To which should be assigned the greater weight in our final estimation, it would seem impossible, in the totality of experience, to determine.

First — Our outward perplexities arise from our presbyopic patients coming to us in bad ocular condition. By deferring their visits till long after the presbyopic condition has declared itself, or after having tampered with their eyesight by wearing improper glasses, or making frequent and unwarranted changes,—the so-called "trying"* act,—we have presented

* There is in rural New England a large class of "tryers" whom the spectacle peddler visits once — sometimes twice — each year changing their glasses every time he makes his round, the patient paying a dollar and the peddler taking their glasses in exchange for a newer pair. This unphysiological and unoptical performance oftentimes goes on till a person has changed their glasses a dozen or fifteen times in a few years.

for our consideration, not merely the physiological condition of presbyopia, but a more or less distressing asthenopia engrafted thereon. In a considerable proportion of such cases, the ophthalmoscope will disclose internal congestion of the choroid, retina, nerve-head, etc., one or all.

Second—Our *inward* perplexity resides in the fact that we have never had and have not now, a satisfactory *objective* method of prescribing for presbyopia, as we have for myopia, hyperopia, and astigmatism, and must perforce depend largely upon the declarations of the patients themselves as to their optical needs. How transcendently unsatisfactory such a method of procedure is in any branch of refraction work, no ophthalmologist of many months' experience need be informed. Patients may almost invariably be relied upon to select a glass much too strong for the proper correction of his or her presbyopia. This is especially apt to be the result if a low grade of internal congestion happens to exist in conjunction with the presbyopia. Equally, if, indeed, not more so, will this result ensue if the patient chances to be asthenopic. Not infrequently all these untoward conditions will be found operating in pernicious unison. Woe betide that oculist who has the temerity to prescribe glasses for a presbyope in such a condition, particularly if the element of a neurotic temperament chances to interpose as a further complication. A beverage of gall and wormwood will be as delicious as nectar in preference to such an experience. And yet our patients will come into our consulting rooms with the utmost complacency and a winsome suavity of manner, and acquaint us with their needs! The diagnosis is all made for us in advance, leaving *us* nothing to do except to register and execute their predetermined decrees. They need "glasses to read with," we are blandly informed; or, in the most debonnair manner conceivable, are told that "my glasses need changing—they are not strong enough," etc. Rarely, if ever, are we met with the declaration that their glasses are too strong—the most usual condition, especially where a low grade of astigmatism exists. The public have not learned that *equalization* and not *magnification* of the dioptric media is the desideratum that it is often the most needful to supply, the lack of which causes so much headache and indistinctness of vision. It is doubtful if they ever will realize it even though ceaselessly dinned in their impressionless ears, until it finds a place in the councils of the "Old Granny"* conclaves, at whose shrines many of our presbyopic patients have knelt before favoring (?) us with a call. In this temple, dedicated by and held forth sacred to the order of the "Old Grannies," whose chief cornerstone is ignorance or self-

*People deeply learned in the mysteries of "Spookology," and whose self-appointed mission in life seems to be the offering of unsolicited advice to their friends and acquaintances upon subjects concerning which they themselves are uninformed or misinformed, and who generously (?) impose the responsibility of following said advice upon some one other than themselves.

conceit, *magnification* is the fetich before which its devotees bow the adoring knee. The mere suggestion to such a patient of the "dark room" and an ophthalmoscopic examination of the interior eye-ground will frequently call forth the defiant rejoinder that such procedure is wholly unnecessary, and that "my eyes are all right, I only need stronger glasses to read with." In other words, they have come to us with the avowed intention of themselves picking out from our test-cases a pair of lenses (usually from a quarter to half or an entire diopter too strong), which, in *their opinion*, not ours, corrects their presbyopia. It is superfluous to indicate what ordinarily happens to both patient and oculist if the latter is weak enough to prescribe lenses without first knowing the internal condition and the total refraction of the eye as well as its muscular response. In a few days or weeks at most, he is again favored with a call and invited to "change the glasses"—at the oculist's expense, of course! And so the ridiculous process is likely to go on *ad nauseum*.

The counterpart of such a patient is to be found in every community. Their chief mission in life would seem to be that of weaning the oculist's affections from earth and inspiring him with an unutterable yearning for that world where we are soothingly assured they have "need of neither the light of the sun nor of the moon," and where, presumably, therefore, *magnifying* lenses are unknown.

But suppose we succeed in getting our presbyopic patient into the "dark room" and by the aid of the ophthalmoscope find, for instance, choroidal congestion? To prescribe spheres under such conditions is only to add to the sum of our own future woes, leaving out of account the harm likely to be entailed upon our patient. It is rest and treatment that is demanded, which involves the withholding and prohibition of the use of glasses entirely for awhile. The treatment includes placing the eyes at rest with a mydriatic (if no contra-indication to its use is present, and sometimes even then, *guardedly*, in alternation with pilocarpin), and keeping them so until every trace of internal trouble has subsided. Of course this applies equally to retinal hyperæsthesia and a variety of kindred conditions needless here to particularize. But the patient objects. Either the time cannot be spared or it is deemed unnecessary; or again, the consulted symposium of "Old Grannies" has declared that it is dangerous to have "drops" put in the eyes. Perhaps some timid physician has read in the elementary text-books concerning the possibility of glaucoma ensuing from the use of mydriatics and generously confides his fears to our patient. At all events, the patient declines our recommendation of ocular rest and treatment. What next shall we do? Shall we attempt to fit a pair of reading glasses by the subjective method —the only known procedure available in presbyopia? In other words,

shall we resign our functions as ophthalmologists and thus become merely our patient's scribe or errand boy? The only treatment for such a condition is to collect our examination fee and politely decline further connection with or responsibility for the case. That important feature of the treatment should be emphasized—*the collection of the fee.* Such exaction will have a salutary effect alike upon patient and physician and inure to the lasting advantage of ophthalmologists generally. That such conditions may not be lightly dismissed from the reader's consideration as being rare or far-fetched, the writer desires to say that his case books for the past three years show that 55 per cent of all his presbyopic cases had internal ocular complications varying in degree from slight congestion up through various grades to grave permanent lesions. In other words, only 45 per cent of his presbyopes were entirely free from such conditions as above described.

Let me introduce another type of patient. He, too, is a presbyope who is not enjoying his reading glasses. Examination discloses congestion (eye-strain) or muscular asthenopia consequent, presumably, upon uncorrected ametropia. He is astigmatic, with or without symmetry of axes and yet by dint of squinting—muscular effort—contrives to read 20/20ths on the distance-cards. You feel sure that his uncorrected ametropia for distance is the cause of his discomfort when using his eyes for near work. His eyes are in a state of constant fatigue resulting from the dissipation of muscular and nervous energy in *forcing* a perfect focus of objects through an imperfect optical apparatus. Without correcting his astigmatism for distance and thus preventing the further waste of nervous force, you know that it is impossible to secure for him comfortable convergence. The patient is informed that his eyes can only be made comfortable for near work by wearing glasses for distance. He smiles upon you half contemptuously, half pityingly, and declares that he will not wear a distance-glass—that he does not need it; or, though seeing well through your test lenses, he "sees as well" without them, not knowing that that is one of our most reliable subjective tests of the existence of hyperopia. Sharing in the popular ignorance, he partakes also of the popular fallacy in believing that glasses are only to be worn to improve the *quantity* rather than the *quality* of one's vision. In vain you explain to him that it is not so much the amount that a person sees as *how* he sees, the vital question being as to whether it is done *without strain;* that twenty pairs of glasses are prescribed nowadays to enable one to *see without strain* to one pair given purely to improve the quantity of sight. But the patient remains obdurate. He himself has decided the question, thus usurping your functions and becoming both patient and physician. It is another instance of what may pertinently be called the

"magnificationphobia" that has seized such firm hold of American people. If your proposed distance correction only magnified, doubtless he might be inclined to lend you a listening ear, but knowing nothing of ocular anatomy and physiology, and less of the principles of refraction, *he* does not understand that *equalizing* the meridians of the dioptric media will relieve nerve and muscle tension and so render possible a condition of ocular repose. But worse than his lack of optical knowledge (which he cannot reasonably be expected to possess), is his lack of confidence in you. He refuses to accept your word for that which he himself does not understand. When he asks you for a prescription for reading glasses and refuses your recommendation for a distance-correction, what shall you do? There is but one thing that you can do consistently with self-respect and professional dignity. You must decline to become his scribe and errand-boy by refusing to order the reading glasses he desires. To yield to his demands is only to lay in store for yourself or some brother oculist greater perplexity and annoyance. His reading glasses will, in most instances, prove utterly unsatisfactory, and in prescribing them you will have brought disapprobation not alone upon yourself, but upon the science of ophthalmology as well.

We are admonished by both experience and observation that compromises are as fruitless of permanent satisfaction in ophthalmology as in statesmanship, and that cowardice everywhere is the efficient handmaid of ignorance and prejudice. The proper treatment of this class of patients is similar to that advised above,— collection of the examination fee, and declination of further connection with the case.

Still another annoyance frequently met with in these presbyopic cases is their penchant for a variety of glasses. The patient is found reading at ten inches with, for instance, + 3.00 D.S. You correct him with, perhaps, + 2.00 D. S. which gives clear and easy vision at twelve or fourteen inches — the proper reading distance. The patient carefully preserves his + 3.00 D. S. and uses them in alternation with the correction you have given him, usually to the disadvantage (in his estimation) of your prescription. This alternation in the strength of the lenses admirably serves to so tease the accommodation as to render in the course of time every glass utterly unsatisfactory. Patients ought to be forbidden to use any other glass than that prescribed, and were it practicable, all their old glasses should be "called in" and confiscated. It is unfortunate that we cannot in such cases confiscate other people's property except pursuant to legal processes. Therefore the oculist must content himself with forbidding their use. Even after we have done this, it need not occasion surprise to find the patient disobeying our instructions, or what is still more disgusting, to receive complaints of the unsatisfactoriness

of our prescription when they have rendered our work uncomfortable by teasing and tormenting the accommodation with glasses they were expressly forbidden to use. If some method could be devised to abstract all the glasses a patient had accumulated, and thus force him to rely upon one pair, it would be a great gain in comfort for both himself and his oculist.

Thus much for our perplexities from *without.*

The question that still remains for our determination is that which comes from *within.* This consists in our own limitations in the management of uncomplicated cases of presbyopia. We sorely feel the need of some efficient objective method by which to determine the strength of the sphere to be given our patients. We do not relish our position of slavish dependence upon their untrustworthy answers. This applies only to cases where there is no complication and no error in distant vision. If full credence be given their answers in the choice of spheres, we may expect, in the majority of cases, to be revisited by such patients in a very short time, complaining that their "eyes ache" or "run water," and a score of other recitals of similar import. They will inevitably choose a sphere much stronger than is required, with the result of irritating the accommodation, if not otherwise seriously injuring their eyes. It is precisely at this juncture in our work that we would most appreciate the benefits of skiascopy and lament its inapplicability to these troublesome cases. We can by its aid readily and accurately select our cylinders, but there its assistance to us in presbyopia necessarily must cease. *It cannot measure the amount of accommodation that still remains.* How, then, shall we decide, independently of the patient, the amount of spherical assistance we ought to give him? The writer regrets that he has nothing to suggest that is entirely satisfactory to himself in meeting this difficulty. It is hoped that what has been said upon the subject of presbyopia may be sufficiently productive of good results as to lead to an interchange of views upon the part of our colleagues. In this way may we not hope that some better method of procedure in dealing with presbyopia will be formulated and adopted? If such a coveted result shall happily ensue, the dismal coloring which necessarily characterizes this paper will have found its justification in having contributed in a slight degree to such a desirable denouement.

The writer desires, in conclusion, to say that while he has nothing to suggest that will entirely relieve the ophthalmologist from the perplexities that come from *within,* the method about to be outlined has been found by him greatly superior to any previously tried procedure. Results secured by an objective method solely, cannot in the very constitution of things ever be relied upon to yield results that will be entirely or

essentially satisfactory. It remains to be said, however, that since the adoption some years ago of his present working method, much of the former dissatisfaction experienced alike by patient and oculist in the treatment of uncomplicated cases of presbyopia has been avoided. It is only in the absence of a better method that the following is commended:

Considering an eye presbyopic when the *punctum proximum* has receded further than eight inches, the test is begun with weak convex spheres and continued until one is found that enables Jaeger No. 1 to be read at fourteen inches. This fine print is then brought to within eight inches of the eye, and if not tolerably readable there, stronger spheres are added until it becomes so. With this lens, No. 1 at fourteen inches is again tried and strengthened successively until the maximum clearness *seems* to have been attained. The patient will then probably have chosen a glass varying from 0.25 to 1.00 D. too strong, reference being had to the best *permanent* care of the eyesight. Adduction and abduction are then carefully tested. If adduction and abduction sustain normal relationship to each other, 0.37 D. is ordinarily deducted from the strength of the lens with which the patient declared the clearest vision at fourteen inches was obtained, provided the same print — Jaeger No. 1 — was *readable*, even if not clear, at eight inches. If, however, adduction was found to be below par, fully 0.62 D. is deducted, sometimes even more, and a few drops of a solution of philocarpin (two grains to the ounce) is directed to be instilled into the eyes night and morning. Should adduction be found markedly reduced, accompanied with asthenopic symptoms, prismatic gymnastic exercises after Dr. Gould's method are recommended for a few weeks, with instillations of philocarpin, before glasses are prescribed at all. Where defective abductive power is found, but which is moderate in amount, usually only 0.25 D. is deducted from the lens declared by the patient to afford the greatest acuity of vision at the distances above mentioned. *In no case, however, should the full strength of the spherical lens selected by a presbyopic patient ever be prescribed.* Experience has abundantly and repeatedly demonstrated that to so prescribe is the bitterest of errors, and becomes a source of distress to both the patient and oculist.

Finally, it is recommended that if the presbyope be seen early enough and before the conscious need of glasses has become serious, he be given a weak pair of spheres, with directions to use them only by artificial light, on cloudy days, and at night. The accommodation may very properly be left to take care of itself during the daytime for some time after presbyopia has been established. Investigation will disclose that for a considerable period after presbyopia is established, the static as well as the dynamic refraction of the eye differs materially at nightfall or by artificial light from what it is in the daytime. It is at this pivotal point in the decline of their virility, that eyes are most apt to become strained, and from which lenticular opacities (cataracts) are very prone to date their beginnings.

The Refractionist.

A Journal of Practical Ophthalmology.

EDITORS:
FRANCIS F. WHITTIER, M. D., 218 Boylston Street, Boston.
MAURICE F. PILGRIM, 472 Congress Street, Portland.

Original Articles will be paid for in cash or reprints.
All articles for publication should be typewritten if possible.

Prevention Better than Cure.

Despite the wild waves of surgical enthusiasm which ever and anon surge and sweep over the profession, almost entirely obscuring for the time the physician and leaving only the surgeon in full view, medicine is steadily advancing. One still hears occasionally from the unfriendly lips of laymen, the assertion that while surgery has made rapid strides, medicine has made little or no progress in the last generation. Every physician realizes the untruthfulness of such a statement. Ours is not a profession that lends kindly recognition to a narrow specialism in any department. We welcome every new advance in surgery and medicine irrespective of the particular line of practice in which our energies and thoughts may chance to be enlisted.

While surgery has made a brilliant record in the last decade, it must not be forgotten that medicine, too, is not without its trophies. Not the least among them has been our progress in the direction of what may be termed "preventive medicine." Not many years ago tracheotomy and intubation was at the height of their popularity, and many valuable lives were undeniably saved by the timely interposition of these surgical procedures. But more recently medicine has come to the front, and, with antitoxine, promises to render tracheotomy and intubation unnecessary. We are thus likely to cure diphtheria before the ravages of the poison invades the larynx. Apostoli taught that very many uterine fibroids could be absorbed by the galvanic current and without recourse to the knife. Very recently men whose attainments and eminence challenge our attention and command our respect, have claimed the entire *curability* of appendicitis without operative interference. All honor to surgery. Its achievements have been as beneficent as they have been brilliant. Let us never forget, however, that surgery must ever be regarded as the *despair* of medicine; and that the greatest surgeons are never willing to operate until all the other agencies have demonstrated their impotency to cure.

In no department of medicine has prevention of disease enlisted more earnest attention or achieved more signal success than in ophthal-

mology. The older text-boooks were devoted largely to pathology and treatment, much of the lattef being surgical. Little space was devoted to refraction. The more modern text-books, on the contrary, have given a great deal of attention to this important branch of ophthalmic science. It is becoming more apparent each year that, in proportion as we come to a better recognition of the part that bad refraction plays as a causative factor in disease and its correction is undertaken, the necessity for medical and surgical treatment diminishes. We have learned long since, that success in the treatment of many external ocular disorders, such as recurring conjunctivitis, blepharitis, or tinea tarsus, meibomian cysts, etc., — once believed to be of purely local origin — is largely conditioned upon first correcting the bad refraction, upon which, in the majority of cases, they depend.

Not every general practitioner even yet is prepared to accept this as a fact, although it is not believed to be longer open to doubt among oculists. If the eye-strain resulting from bad refraction is sufficient to produce meibomian cysts and other inflammations of the lid, why may we not justly suspect it of being the provocative factor in more serious disorders of the eye? Senile cataracts do not develop until late in life, when the vital forces of the entire body are steadily becoming minimized and less able to repair the ravages of tissue waste and injury. Have we not at least reasonable ground for suspecting that long continued eye-strain may be, after all, the potent factor in the causation of this malady?

So, too, in respect to glaucoma. While the exact etiology of this intractable and destructive disease still remains open to much doubt and speculation, it is generally agreed that stenosis or obliteration of the filtration angles — the Canal of Schlemm and the spaces of Fontana — are its secondary causes. But why do these spaces become closed? The reply is not difficult to anticipate. Pressure from the interior of the eye. But what is the cause of the increased intra-ocular pressure? At this point the report of Dr. Swindell becomes highly interesting. In twenty-five cases of glaucoma seen by him, he found faulty refraction in nineteen — the other six could not be tested satisfactorily — and all were hyperopic, or hyperopic with astigmatism. Oculists well know the mischievous capabilities of uncorrected hyperopic astigmatism. They also know that it is more productive of muscular abnormalities, asthenopia, and the long train of disorders that follow eye-strain, than either myopia or myopic astigmatism. It requires much less courage to affirm the probability that Dr. Swindell's nineteen cases of glaucoma were due to eys-strain than to deny it. It is our hope and belief that the early recognition and proper correction of defective refraction is destined to

accomplish as much for ophthalmology in preventing many of the more serious forms of ocular disease, as have better methods of sanitation and hygiene in the prevention of desolating plagues and recurring epidemics.

Refraction work, meanwhile, ought to receive recognition more nearly commensurate with its commanding importance than is now accorded it by the general practitioner. The prevalent notion that "fitting glasses" is such an inconsequential task that anybody (without medical knowledge and special preparation and experience) who so chooses is warranted in undertaking it *solely* for the purpose of pecuniary gain, is one of the most monstrous of errors. The erradication of this prevalent popular fallacy will work incalculable good, not so much for the individual oculist as for ophthalmology and the well-being of the public.

* * *

Opticians Legislating.

We are indebted to a subscriber in New York for a copy of an Act introduced into the New York Assembly "To incorporate the Optical Society of the State of New York for the purpose of improving and regulating the practice of dispensing and refracting opticians of this State."

This is the first attempt, so far as we know, to procure legislation on the part of the pseudo-opticians. We say "pseudo," because we understand that opticians in the strict sense of the term are not in favor of the bill. We trust the physicians of the State will be alert enough not to submit to the passage of the act without vigorous resistance. We understand that recently a copy of "Shall Opticians Attempt to Fit Glasses?" was on the desk of each member of the Assembly. If this is carefully read there will not be much danger of the passage of the act.

The following is from an appeal recently issued by the Medical Society of the State of New York, to the medical profession:

"This bill gives to the New York Optical Society, which is not composed of medical men, the exclusive right to issue certificates to opticians, charging for each the sum of $25; certificates which it can revoke at its pleasure. It also has the power to license 'refracting opticians,' thus putting in the hands of incompetent people the right to fit glasses for various troubles of the eyes,—privileges which should be only in the hands of competent physicians.

"The members of the Legislature are, in nearly every instance, willing to be guided in these matters by the expressed desires of the medical profession; it is, therefore, requested that every physician throughout the State write to the Senator and Assemblyman representing his district, protesting against this bill, and requesting the representative to use his influence to defeat it.

"This bill is known as Assembly Bill No. 727, which number please use in writing to your representative."

Selection.

Oculist-Opticians. The great prevalence of errors of refraction in the human eye and the modern recognition of the important relation they sustain to weak eyes, defective vision, headache and certain reflex phenomena affecting the general nervous system, has served not only to attract many physicians into the special field of ophthalmic practice, but has made possible a lucurative business for large numbers of skilled opticians, whose special function it is to prepare correcting glasses in conformity with the more or less elaborate mathematic formulæ written by the ophthalmic surgeon. Great good has resulted to the community in the relief of pain and weak eyes, and in affording increased efficiency for work in all pursuits requiring accurate vision.

It is cause for serious regret, however, that the increasing demand for correcting glasses has excited the cupidity of a horde of persons who are always to be found hanging on by the fringe of professional life, but thoroughly imbued with the spirit of the charlatan. As in the field of general medicine, men of this class turn their attention to irregular practice or to the manufacture of nostrums and proprietary drugs with secret formulæ; so, in ophthalmology, without other consideration than the hope of financial gain, they have turned their attention to the furnishing of spectacles to the multitude. Unfortunately, a great impetus was given to this evil through the efforts of several large optical firms, by whom the pernicious seed was sown broadcast throughout the country, and has borne fruit in the formation of innumerable "optical schools," whence emanate after a six-weeks' course of instruction, large numbers of so-called "oculist-opticians," duly supplied with the diploma of the school, a box of trial glasses, a table of test letters, an astigmatic chart, and such other paraphernalia as they can be induced to purchase, With rare exceptions these "graduates" are without medical training. have the merest outline knowledge of the gross anatomy of the eye, and have no understanding of the physiology of vision, while the rudimentary instruction in optics which they have received gives them no adequate knowledge of the properties of lenses. They return to their homes, establish themselves in some jeweler's store, and, by glaring advertisements of "examinations free," attract large numbers of persons, with uncomfortable or painful eyes, into their warily-spread net. It is needless to say that these emerge with a pair of glasses. Such is the inevitable

result; it matters not whether the discomfort complained of is the result of eye-strain or of a pathologic lesion. Every ophthalmic surgeon is frequently called upon, not only to remove from his patients concave glasses when convex ones were required, or the weakest spherical lenses, for which an exhorbitant price had been paid, when compound glasses were needed to correct an existing astigmatism. But, even worse than this, many persons suffering from progressing pathologic changes affecting the intra-ocular membranes, have pinned their faith to the "oculist-optician," receiving frequent changes in their glasses until irreparable damage has been done by the advancing disease.

We have seen many cases of choroiditis thus unfortunately placed, and can recall two cases of patients with optic neuritis and headache, both of whom had received at the hands of the same "oculist-optician" successive pairs of glasses, until the stage of atrophy, with the narrowing field, and progressive loss of vision drove them to seek professional aid. Both cases eventuated in total loss of sight. While this might have been the result, in spite of professional advice, nevertheless the only time during which treatment could have been availing was wasted, under the fraudulent advice of an uneducated charlatan. It may be said that he was honest in his endeavor to relieve by glasses; but, nevertheless, his ignorance was, under the circumstance, a crime. The frequent and intimate association of ocular affections with general disease, and the fact that the symptoms simulate so closely those which grow out of the need for correction of some optical defect, is sufficient reason for giving to the furnishing of glasses the same legal status which obtains in the prescribing of drugs. No one, not legally entitled to practice medicine by virtue of his attested medical training, should be permitted to enter this field of physiologic optics.—*Editorial by Prof. S. D. Risley, M. D., in "The Philadelphia Polyclinic" of February 8, 1896.*

BOOK NOTICES.

The Functional Examination of the Eye. By J. Herbert Claiborne, Jr., M. D., adjunct Professor of Ophthalmology in the New York Polyclinic, etc., etc. 100 pages, with 21 illustrations. The Edwards & Docker Company, 518 Minor street, Philadelphia, Pa. Price $1.00. 1895.

This book consists of a number of lectures delivered at the New York Polyclinic during the last eight years and more particularly of a number of lectures or lessons in a practical course delivered to the graduating classes at the College of Physicians and Surgeons, New York.

A work of value to students and beginners.

Manual of the Essentials of Diseases of the Eye and Ear. By J. H. Buffum, M. D., Professor of Ophthalmology and Otology in the Chicago Homœopathic Medical College, etc., etc., 315 pages, with illustrations in black and chromo lithograph. Gross & Delbridge Company, Chicago.

This manual, written at the request of the author's classes, is in the form of questions and answers. It covers the field well, and is valuable as a quiz compend.

***

Eyesight and School Life. By Simeon Snell, F. R. C. S., Ophthalmic Surgeon to the Sheffield General Infirmary, etc., etc. 70 pages, with numerous illustrations. Bristol, England: John Wright & Co.

***

Electricity in Electro-Therapeutics. By Edwin J. Houston, Ph.D., and A. E. Kennelly, Sc.D.

The book contains 412 pages and 128 illustrations. Price $1. W. J. Johnston Company, 253 Broadway, New York. Written to meet a growing demand for reliable information respecting such matters in the physics of electricity applied to electro-therapeutics as can be readily understood by those not specially trained in electro technics.

***

Obstetrical Pocket Phantom. By Dr. K. Shibata, specialist in Gynæcology and Obstetrics, Tokio, Japan. Preface by Professor Franz von Winckel. Eight illustrations, one pelvis and two jointed manikins. Translated from the third edition by Ada Howard-Audenried, M. D., physician to the children's clinic in the Woman's Hospital, Philadelphia. $1.00. P. Blakiston, Son & Co., 1012 Walnut street, Philadelphia, Pa. 1895.

***

Color-Vision and Color-Blindness. A Practical Manual for Railroad Surgeons. By J. Ellis Jennings, M. D. (University Pennsylvania), formerly Clinical Assistant Royal London Ophthalmic Hospital (Moorfields); Lecturer on Ophthalmoscopy and chief of the Eye Clinic in the Beaumont Hospital Medical College; Ophthalmic and Aural Surgeon to the St. Louis Mullanphy and Methodist Deaconess Hospitals; consulting oculist to the Missouri, Kansas and Texas Railway System; Fellow of the British Laryngological and Rhinological Association; secretary of the St. Louis Medical Society. Illustrated with one colored full-page plate and twenty-one photo-engravings. Crown octavo, 110 pages. Cloth $1, net. Philadelphia: The F. A. Davis Company, publishers, 1914 and 1916 Cherry street.

This is a valuable addition to ophthalmological literature. It should be in the library of every physician.

HYDROZONE IN PURULENT OTITIS MEDIA.

On November 4, 1895, I was consulted at my office by Robert P——, aged 24 years; occupation, laborer in the Armour Packing Company. The patient complained that for about four weeks he had been suffering from intense pain in his left ear, making it impossible for him to sleep at night or rest during the day. The pain was so severe that at times he apparently lost consciousness, and it seemed to extend through his entire brain. Upon inspection, the man's face was found terribly deformed; an edematous swelling the size of one-half of an ordinary loaf of baker's bread occupied the usual location of the ear and the surrounding muscles. The auricle of the ear was almost buried in edematous tissue; upon palpitation, the part was found intensely tender, and deep pressure evoked expressions of excruciating pain. The integument and subcutaneous tissue were thoroughly infiltrated. Ichorous, fetid pus was slowly exuding from an almost imperceptible meatus. The patient expressed feelings of chilliness, showing a possible septic contamination of his system. Every indication and sign pointed to a possible suppuration of the mastoid cells. * * * * I immediately placed the patient under heroic doses of elixir of the six iodides internally. After laborious effort I succeeded in separating the edematous tissue sufficient to admit the introduction of a small Eustachian catheter into the external meatus. Through this, with a small hard rubber syringe, I injected four times daily about one-half an ounce of hydrozone, allowing it later to drain away, advising hot fomentations. The patient was confined to his bed and the best possible hygienic surroundings provided. In twenty-four hours after the treatment was commenced, the intensity of the odor, amount and character of the discharge had manifestly lessened, the swelling was reducing, and the patient feeling better. The edema being lessened, the aperture was enlarged. I now recommended the injection of hydrozone through a catheter of larger caliber, every hour, requiring the head to be kept turned to the opposite side for ten minutes to allow the percolation of the hydrozone as deeply as possible into the middle ear, before reversing the position to allow drainage. We continued this treatment for a week, the man's recovery progressing with remarkable rapidity, his pain and the constitutional symptoms having disappeared about the third day. At the end of eight days the swelling had entirely disappeared, his features were again normal, and he expressed himself as perfectly well. An examination showed a circular perforation in the ear-drum the size of a shot, proving that the case had been one of purulent otitis media, with septic contamination of the patient's system, and infiltration of the surrounding cutaneous tissues. Small incisions were made at two different places to permit the exit of pus from the integument. The mastoid was found not involved. The rapidity with which the disease yielded after the introduction of hydrozone through the catheter into the middle ear impressed me with the wonderful value of the preparation; for, struggling with such cases during a practice of seventeen years, I have never seen its efficiency equalled by any medicinal or operative procedures.—*Report of a Case Supposed to Involve Inflammation of the Mastoid, by Wm. Clarence Boteler, M. D., Kansas City, Mo.*

Contents of Volume II.

A Few Absurd Practices,
Clark W. Hawley, M. D., 1
EDITORIALS: 7
Optical Schools; Refraction Topics.
SELECTIONS:
The Growth of Ophthalmology 9
Tenotomy of Eye Muscles for Epilepsy, 11
Massage of the Cornea, 13
Oblique Astigmatism, 14
Javal's Ophthalmometer, 15
Scopolamine as a Mydriatic.
Arthur G. Hobbs, M.D. 17
EDITORIALS: 23
Interchangeable Prisms.
SELECTIONS: 24
Refraction in Schools. (Extract from a paper read before Minnesota Academy of Medicine, by Frank Allport, M. D.)
Practical Points gained in the Treatment of one thousand cases of Insufficiencies of the Ocular Muscles.
J. Walter Park, M. D. 33
Simple Tests of the Eye.
David A. Strickler, M. D. 37
Abstracts from American edition Annals D'Oculistique. 48
Do Mydriatics Injure or Benefit the Eye? A review of results in one hundred consecutive cases.
Maurice F. Pilgrim, A. B., M. D. 49
SELECTIONS:
An Optical Training. 58
Note on Smoked Glasses. 61
Imperfect Eyes Among School Children: How Caused. 62
Book Notices. 64
Homatropine Hydrobromate. 65
Clarence R. Dufour, Phar. D., M. D.
Anisometropia. *C. W. Hawley, M. D.* 66
Latent Astigmatism. 67
Horace M. Starkey, M. D.
SELECTIONS:
Hospitalism. 68
Further Observations on Convergent Squint. 76
Peroxide of Hydrogen. 80
Should not Oculists be More Careful in Prescribing Colored Glasses? 81
W. L. Bullard, M. D.
Mydriatics Not Needed. 83
Thos. M. Stewart, M. D.
EDITORIALS:
An Association of What? 85
SELECTIONS:
Insufficiency of the Orbital Muscles. 89
Commissions. 95
Shall Opticians Attempt to Fit Glasses?
Maurice F. Pilgrim, M. D. 97
SELECTIONS:
Mercurials in Ophthalmic Practice. 107
EDITORIALS:
"Refract." 111
School Officers and Teachers. 112
Retinoscopy. 112
Shall Opticians Attempt to Fit Glasses?
Maurice F. Pilgrim, M. D. 113
SELECTIONS:
School Children's Eyes—A Plea for Examination of Every Child's Eyes When Commencing to Attend School. 121
EDITORIALS:
Education then Legislation. 127
Duplicates, Etc. 128
Practical Retinoscopy.
Clark W. Hawley, M. D. 129
SELECTIONS:
Ocular Symptoms in Diseases of the Spinal Cord. 133
Astigmatism of Twenty-Eight Dioptries. 141
Positive Aberation. 142
EDITORIALS:
Fees. 143
The Refractionist. 144
Co-Editor and Removal. 144
Missionary Work. 144
Practical Retinoscopy.
Clark W. Hawley, M. D. 145
Report on Examinations of the Eyes of 1900 School Children of the Public Schools of San Francisco.
Kaspar Pischl, M. D. 151
EDITORIALS:
A Happy New Year—The Refractionist's Platform for 1896. 156
Inconsistent Medical Legislation. 158
Education.—Reprints. 159
No Controversy. 159
COMMUNICATION. 160
Practical Retinoscopy.
Clark W. Hawley, M. D. 161
Evolution or Revolution — Which?
Francis F. Whittier, A. M., M. D. 165
SELECTIONS:
Eye Strain a Cause of Noctural Enuresis. 169
COMMUNICATIONS. 171–173
EDITORIALS:
Asthenopia. 174
Doubtful Axes. 175
Presbyopia. *Maurice F. Pilgrim, M. D.* 177
EDITORIALS:
Prevention Better than Cure. 185
Opticians Legislating. 187
SELECTION: Oculist Opticians. 188
Book Notices. 189
Table of Contents, Vol. II. 192

HI
955